151812

REMEDIAL ACTION MASTER PLAN

ENVIRONMENTAL CONSERVATION & CHEMICAL CORPORATION (ECC)

01-5V30

31 March 1983

TABLE OF CONTENTS
ECC Site
01-05V30.1

		Page
1.0	EXECUTIVE SUMMARY	1-1
	1.1 Purpose	1-1
	1.2 Site Location	1-1
	1.3 Problem Statement	1-1
	1.4 General Approach	1-2
	1.5 Limitations	1-4
	1.5.1 Data Limitations	1-4
	1.5.2 Study Limitations	1-4
	1.6 Initial Remedial Measures	1-5
	1.7 Remedial Investigations	1-6
	1.8 Cost Estimate and Time Schedule	1-7
2.0	DATA EVALUATION	2-1
	2.1 Objective	2-1
	2.2 Background	2-1
	2.2.1 Site Description	2-1
	2.2.2 Site History	2-1
	2.2.3 Remedial Actions to Date	2-7
	2.2.4 Chronology	2-7
	2.3 Hazardous Materials Characterization	2-7
	2.3.1 Bulk Storage Tanks	2-8
	2.3.2 Fifty-Five Gallon Drums	2-8
	2.3.3 Cooling Water and Drum Storage Area Ponds	2-15
	2.4 Environmental Setting	2-15
	2.4.1 Physiography	2-15
	2.4.2 Geology	2-18
	2.4.3 Hydrology	2-20
	2.4.4 Geohydrology	2-21
	2.4.5 Air Quality	2-24
	2.4.6 Ecology	2-26
	2.4.7 Socioeconomics	2-27
	2.5 Assessment of Potential Impacts	2-27
	2.5.1 Public Health and Safety	2-27
	2.5.2 Environment	2-29
	2.5.3 Socioeconomics	2-30
	2.6 Data Limitations	2-30
3.0	REMEDIAL ACTIVITIES	3-1
	3.1 Remedial Action Plan	3-1
	3.1.1 Overall Approach to Site	3-1
	3.1.2 Master Site Schedule	3-1

CONTENTS (Continued)

		Page
	3.1.3 Sequencing, Timing, and Correlations of Projects	3-1
3.2	Initial Remedial Measures	3-4
	3.2.1 Objective	3-4
	3.2.2 Recommended Actions	3-4
	3.2.3 Cost Estimates and Time Schedule	3-8
3.3	Remedial Investigation/Feasibility Study	3-10
	3.3.1 Objective	3-10
	3.3.2 Scope of Work	3-10
	3.3.3 Remedial Investigation/Feasibility Study Estimated Costs/Schedule/ Deliverables	3-31
3.4	Source Control Remedial Actions	3-35
	3.4.1 Objective	3-35
	3.4.2 Remedial Action Alternatives	3-35
	3.4.3 Cost Estimates/Time Schedule	3-36
3.5	Offsite Remedial Actions	3-36
	3.5.1 Objective	3-36
	3.5.2 Recommended Action Alternatives	3-36
	3.5.3 Order-of-Magnitude Level Costs/ Time Schedule	3-37
4.0	COMMUNITY RELATIONS ASSESSMENT	4-1
4.1	Community Relations Background	4-1
	4.1.1 History of Community Relations Activities	4-1
	4.1.2 Community Relations Participants	4-3
	4.1.3 Community Relations Issues	4-6
4.2	Community Relations Plan	4-8
	4.2.1 Objectives of Community Relations	4-8
	4.2.2 Community Relations Techniques	4-9
4.3	Schedule of Community Relations Activities	4-10
APPENDIX A	SITE VISIT MEMORANDUM AND PHOTOGRAPHS	
APPENDIX B	SITE CHRONOLOGY	
APPENDIX C	SAMPLING SUMMARY FOR PRIORITY POLLUTANTS	

TABLES

Number		Page
1-1	IRM Costs and Time Schedule	1-8
1-2	Estimated Cost and Schedule of RI/FS Activities	1-9
2-1	Materials Processed at ECC	2-9
2-2	Description of Materials Processed at ECC	2-10
2-3	Bulk Storage Tank Inventory	2-12
2-4	ECC Drum Inventory	2-14
2-5	Contaminant Concentrations and Water Quality Criteria for Substances Found Onsite	2-17
2-6	Temperatures and Precipitation Data	2-25
3-1	IRM Costs and Time Schedule	3-9
3-2	Estimated Costs for Remedial Investigation/ Feasibility Study	3-32
4-1	ECC Site Community Relations Plan	4-11

FIGURES

Number		Page
1-1	Approach for Remedial Action Master Plan	1-3
2-1	Location Map	2-2
2-2	Vicinity Map	2-3
2-3	Site Map	2-4
2-4	Bulk Storage Tank Location	2-13
2-5	Location of Cooling Water and Drum Storage Area Ponds	2-16
2-6	ECC Groundwater Monitoring Well Log	2-19
2-7	ISBH Water and Sediment Sample Locations	2-22
2-8	Approximate Static Groundwater Level Contours and Sampled Residential Wells	2-23
2-9	Site Locations for Bioaccumulation Study	2-28
3-1	Master Site Schedule	3-2
3-2	Time Schedule for RI/FS Activities	3-3
3-3	Monitoring Well Locations	3-17
3-4	Possible Surface Water and Sediment Sampling Locations	3-20
3-5	RI/FS Time Schedule	3-34

GLT90/1

1.0 EXECUTIVE SUMMARY

This document is a Remedial Action Master Plan (RAMP) for the Environmental Chemical and Conservation Corp. (ECC) site near Zionsville, Indiana. A RAMP is a plan for undertaking remedial investigation activities and remedial actions in response to a hazardous substance release, or a substantial threat of release, into the environment. It is based upon the National Oil and Hazardous Substances Contingency Plan (NCP) promulgated by the Environmental Protection Agency (EPA) on July 16, 1982 (47 FR 31180-31243).

1.1 PURPOSE

The specific purpose of this RAMP is to define the scope of practical remedial investigation activities or remedial actions for the ECC site along with a schedule of implementation. The RAMP provides cost estimates for each proposed activity and identifies data limitations, community relations strategies, and possible problems that may be encountered during project implementation.

1.2 SITE LOCATION

The ECC site is near the town of Zionsville, in Boone County, Indiana, on 6.5 acres of land on private property owned by John Bankert. The Eagle River Reservoir, a water supply reservoir for the City of Indianapolis, is in the same drainage basin as the site, approximately 10 miles to the south. Much of the surrounding area has been developed for farming and residential uses.

1.3 PROBLEM STATEMENT

Environmental Chemical and Conservation Corp. operated as a solvent processing and reclaiming facility from 1977 until May 1980. During this period, approximately 350 generators disposed of such wastes as resins, paint sludges, waste oils and flammable solvents onsite in 55-gallon drums or by bulk discharge to onsite storage tanks. Some of the solvent wastes were processed and recovered. The site was closed down in early 1982 with an outstanding waste inventory of over 25,000 drums of liquid and solid wastes, and about 300,000 gallons of bulk storage liquids.

Remaining on the site today are areas of contaminated soils, a large inventory of drums and bulk tanks, contaminated water stored in the cooling water pond and in pools on the drum storage areas, the abandoned processing equipment and several abandoned buildings.

The abandoned wastes remaining on the site pose a substantial hazardous threat to nearby residents and site intruders.

Some of the drums stored aboveground have experienced corrosion as a result of standing in ponded water on the site. Site runoff and cooling water pond overflows pose additional threats to the neighboring area and the downstream water reservoir.

1.4 GENERAL APPROACH

Figure 1-1 presents a general flow schematic of the remedial action planning approach being followed for the ECC site. The approach is based on three types of remedial actions:

- Initial remedial measures
- Source control remedial actions
- Offsite remedial actions

Initial remedial measures (IRM's) are remedial actions that are conducted before the selection of an appropriate remedial action if they are determined to be feasible and necessary to limit exposure or threat of exposure to a significant health or environmental hazard and if they are cost-effective. IRM's can be carried out only on sites listed on the National Priority List. The essential criterion for determining the need for IRM's is the existence of an actual or potential significant threat to public health or the environment. Under extreme circumstances, the planned removal of hazardous substances can be carried out as an IRM. However, in accordance with Federal regulations, such actions must be cost-effective.

Source control remedial actions are taken at or near the original source of the hazardous substances or contaminated materials whenever there are inadequate natural or manmade barriers to retard migration. If most of the substances have migrated away from the original source, source control remedial actions may not be appropriate and offsite remedial actions may be required. Treatment of the liquids in the cooling water pond at the ECC site and discharge to Finley Creek is an example of a source control remedial action alternative. An example offsite remedial action alternative is withdrawal of any contaminated groundwater from the plume area downstream of the site, followed by treatment and discharge to a nearby drainage basin.

There must be sufficient information and data available before any source control or offsite remedial measures can be carried out. The RAMP process provides an outline of remedial investigation activities during which the collection and generation of the necessary data will occur.

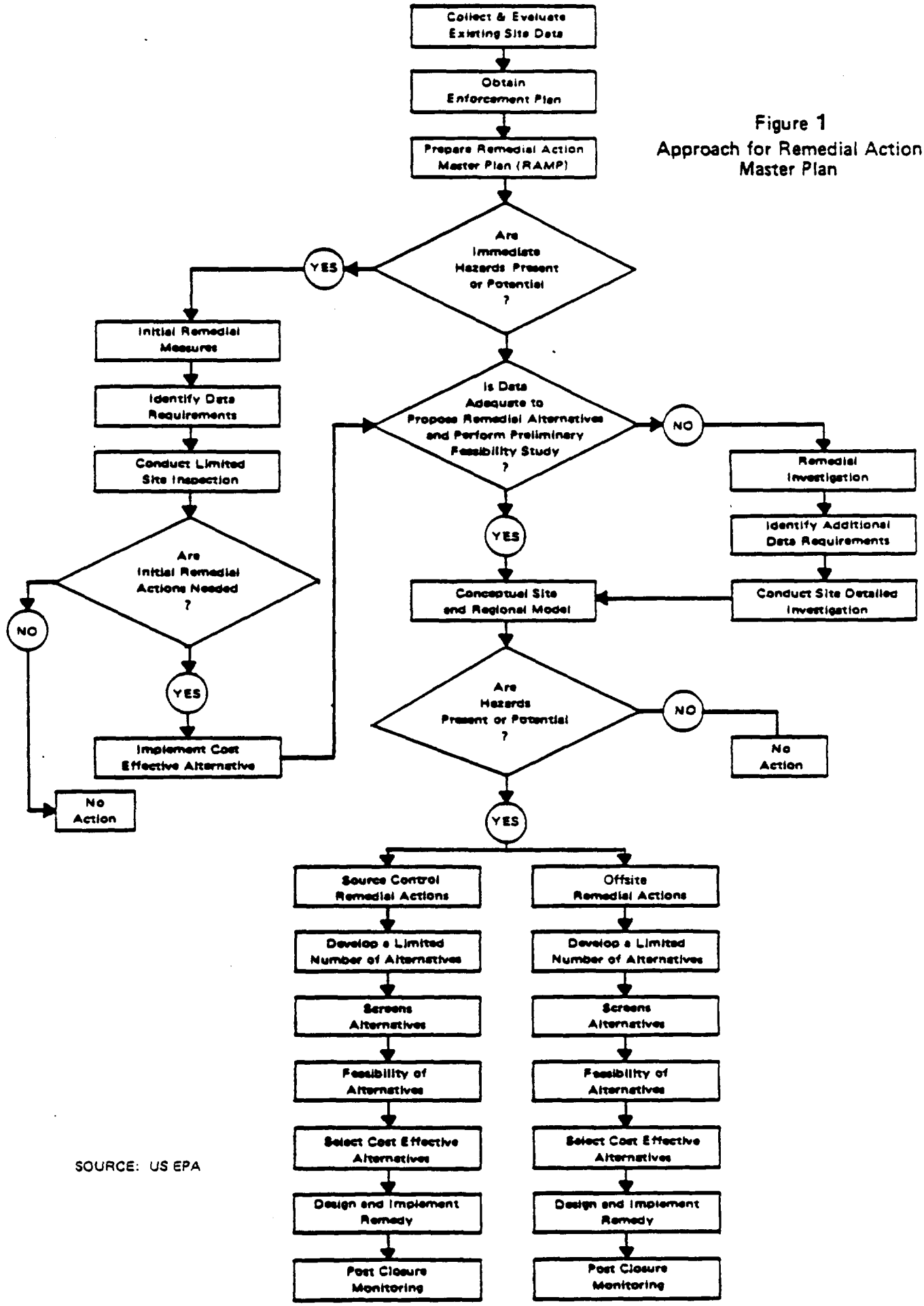


Figure 1
Approach for Remedial Action Master Plan

SOURCE: US EPA

1.5 LIMITATIONS

Several types of limitations apply to the RAMP process. Those that follow are considered particularly relevant to the RAMP process for the ECC site.

1.5.1 Data Limitations

- The existing inventory of drums, tanks, cooling pond water and ponded waters is incomplete.
- A current contingency plan is unavailable for responding to an onsite fire and/or explosion.
- Air quality at the site has not been analyzed.
- A comprehensive list of groundwater wells neighboring the site and particularly south of the site is not available.
- Topographic data for the site is limited to USGS 10-foot contour intervals.
- A detailed hydrogeologic study has not been conducted on the site and surrounding area.
- Data on the extent and type of groundwater contaminants is not complete.
- The degree and areal extent of surface water and sediment contamination is not clearly defined.
- The degree of contamination of stormwater runoff has not been defined.
- Data on the degree and extent of soil contamination and soils percolation properties is not complete.

1.5.2 Study Limitations

- The RAMP does not provide specific remedial actions due to a lack of information necessary to conduct a feasibility study for them.
- Costs provided are order-of-magnitude only.
- The RAMP is basically a planning document with tasks and subtasks suggested as minimum efforts to accomplish its objectives.
- The RAMP budget and development schedule did not permit a focused RI/FS to be conducted of the initial remedial measures.

- The RAMP budget and development schedule did not permit a complete and exhaustive consideration of remedial planning activities.

1.6 INITIAL REMEDIAL MEASURES

Based on observations from a visit to the ECC site on January 20, 1983 and the evaluation of available data, the following initial remedial measures are recommended:

- Conduct a survey to locate and define private wells within a half-mile radius of the site. Sample and analyze water from wells in the area surrounding the site. The basic objective is to determine if contamination has entered the local water supplies. If contamination is detected, appropriate action must be taken to safeguard the health of the local populace.

- Construct a 6-foot high steel fence around the site. This action is intended to prevent unauthorized direct contact with hazardous substances and contaminated materials onsite before and during the implementation of remedial measures.

- Place warning signs around the perimeter of the site and on the fence to warn of the danger of unauthorized entry. This action is intended to prevent direct contact with any hazardous substances and contaminated materials onsite before and during the implementation of remedial measures.

- Remove all materials from the bulk storage tanks as soon as possible and transport them to an approved disposal facility. This action is intended to reduce the imminent hazard of fire and explosion by quickly removing the bulk tank contents.

- Remove all drums as soon as possible. The intent of this action is to reduce the imminent hazard presented by the drums stored onsite.

- Control site runoff and direct it to the cooling water pond for eventual treatment. This action is intended to use the existing cooling water pond as a collection sump for site runoff during initial remedial activities. Tank and drum washings, decontamination water and other miscellaneous drainages will also be directed to the cooling water pond.

- Provide a trailer-mounted activated carbon wastewater treatment system to treat the slightly contaminated water from the cooling water pond and

discharge the treated water to Finley Creek. The intent of this action is to treat cooling water pond contents with a temporary treatment system, discharging the clean treated water to the relatively uncontaminated Finley Creek. Timely acquisition and use of the treatment system will allow the pond level to be lowered before spring wet weather, providing needed surge capacity for the pond.

- o Relocate the existing office and process building power lines offsite. This IRM is intended to prevent a fire and/or explosion onsite due to accidental contact with the existing power line.

- o Prepare an onsite fire and explosion contingency plan. This action is intended to provide a contingency plan to respond to any fires or explosions that might occur on the site before the completion of initial remedial activities.

1.7 REMEDIAL INVESTIGATIONS

Source control remedial actions are those responses taken at or near the original source of the hazardous substances whenever inadequate natural or manmade barriers exist to retard migration. If most of the substances have migrated away from the original source, source control remedial actions may not be appropriate. In this case, offsite remedial actions may be required. Treatment of the standing liquids in the cooling water pond at the ECC site and discharge to Finley Creek is an example of a source control remedial action alternative. An example of an offsite remedial action alternative is removal of contaminated sediments in the drainage ditch and disposal at an approved landfill.

Before either source control or offsite remedial actions can be carried out, sufficient data and information must exist to allow development and screening of alternative remedial actions and the selection, design, and construction/implementation of the recommended remedial action(s). The RAMP process provides for the collection and generation of the necessary data and information through remedial investigation activities.

The following remedial investigation activities are considered necessary and are recommended for the ECC site before feasibility studies for alternative remedial actions are undertaken:

- o Conduct a health and safety site assessment to determine if there are areas within the site that present either potentially hazardous chemical

exposure levels or dangerous physical features and layouts.

- Perform a topographic survey of the site and neighboring drainage ditch to provide data on physical features and facilities.

- Sample and analyze the site surface soils and solidification pit contents to adequately characterize the degree and extent of contamination.

- Locate and install additional groundwater monitoring wells to determine the existence of and to define the horizontal and vertical extent of any contaminant plume and to provide a groundwater monitoring network (shallow, mid-level, and deep) to detect movement of any contaminant plume.

- Sample and analyze the surface water and bottom sediments in the neighboring drainage ditch, Finley Creek and Eagle Creek to adequately characterize their degree of contamination.

- Sample and analyze the groundwater in the monitoring wells to provide a more adequate characterization of the shallow aquifer, mid-level aquifer, and deep aquifer groundwater.

1.8 COST ESTIMATE AND TIME SCHEDULE

The cost estimates and time schedules for the initial remedial measures and the remedial investigation activities are shown in Table 1-1 and Table 1-2. The task descriptions for each initial remedial measure and RI/FS activity outlined in this document define the basis for the associated cost estimates. The cost estimate ranges given in the tables are commensurate with the range of accuracy of an order-of-magnitude level cost estimate. That is, the high and low cost estimates given are -30 percent and +50 percent respectively of the actual estimated cost of the scope of work outlined in this RAMP.

The zero weeks elapsed entry in the time schedules is assumed as the date a work authorization is issued by U.S. EPA.

GLT90/8

Table 1-1
IRM COSTS AND TIME SCHEDULE
ECC SITE

Initial Remedial Measures	Estimated Cost Low($)	Estimated Cost High($)	Schedule of Weeks 2	4	6	8	10	12	14	16	18	20	22	24
Sampling and Analysis of Private Wells	6,900	14,700	----------											
Construct New Fence	13,200	28,300	- - - - - -			----------								
Provide Warning Signs	600	1,200				--------								
Removal of Bulk Tank Contents	181,000	388,000	- - - - - -			----------								
Drum Removal	2,420,000	5,186,000	----------											
Site Surface Runoff Control	4,000	8,600	-----											
Power Line Removal	13,000	18,000	----------											
Cooling Water Pond Treatment and Discharge	250,000	500,000	----------											
Fire Contingency Plan	2,400	5,100	-----											
TOTAL	$2,891,100	$6,149,900												

GLT90/10-1

Table 1-2
ESTIMATED COST AND SCHEDULE OF RI/FS ACTIVITIES
ECC SITE

Task	Estimated Cost Low	Estimated Cost High	Schedule (Months Elapsed) 0	2	4	6	8	10	12	14	16	18	20
1. Work Plan Preparation	$ 5,900	$12,600	---										
2. Site Definition Activities	37,300	72,200		-------									
3. Detailed Site Characterization Studies	155,100	332,500			----------								
4. Remedial Investigation Report	6,200	13,100						-------					
5. Evaluation of Remedial Action Alternatives	13,300	28,400							----------				
6. Feasibility Report	9,400	20,400									------		
7. Conceptual Design	20,600	44,100										--------	
8. Project Management	17,200	37,000	----------										
TOTAL	$265,000	$560,300											

GLT90/14

2.0 DATA EVALUATION

2.1 OBJECTIVE

This section presents available technical data and nontechnical information on the ECC site and its immediate surroundings. Potential impacts resulting from the ECC site contamination are summarized. The evaluation of existing data will help identify the required initial remedial investigation activities, as well as preliminary remedial action alternatives.

2.2 BACKGROUND

2.2.1 Site Description

Environmental Conservation and Chemical Corporation is in Boone County, 865 south U.S. 421, Zionsville, Indiana, about 10 miles northwest of Indianapolis (Figure 2-1). The site occupies 6.5 acres within the 168 acre Northside Sanitary Landfill, an ongoing solid waste disposal facility permitted by the Indiana Stream Pollution Control Board (SPCB) (Figure 2-2).

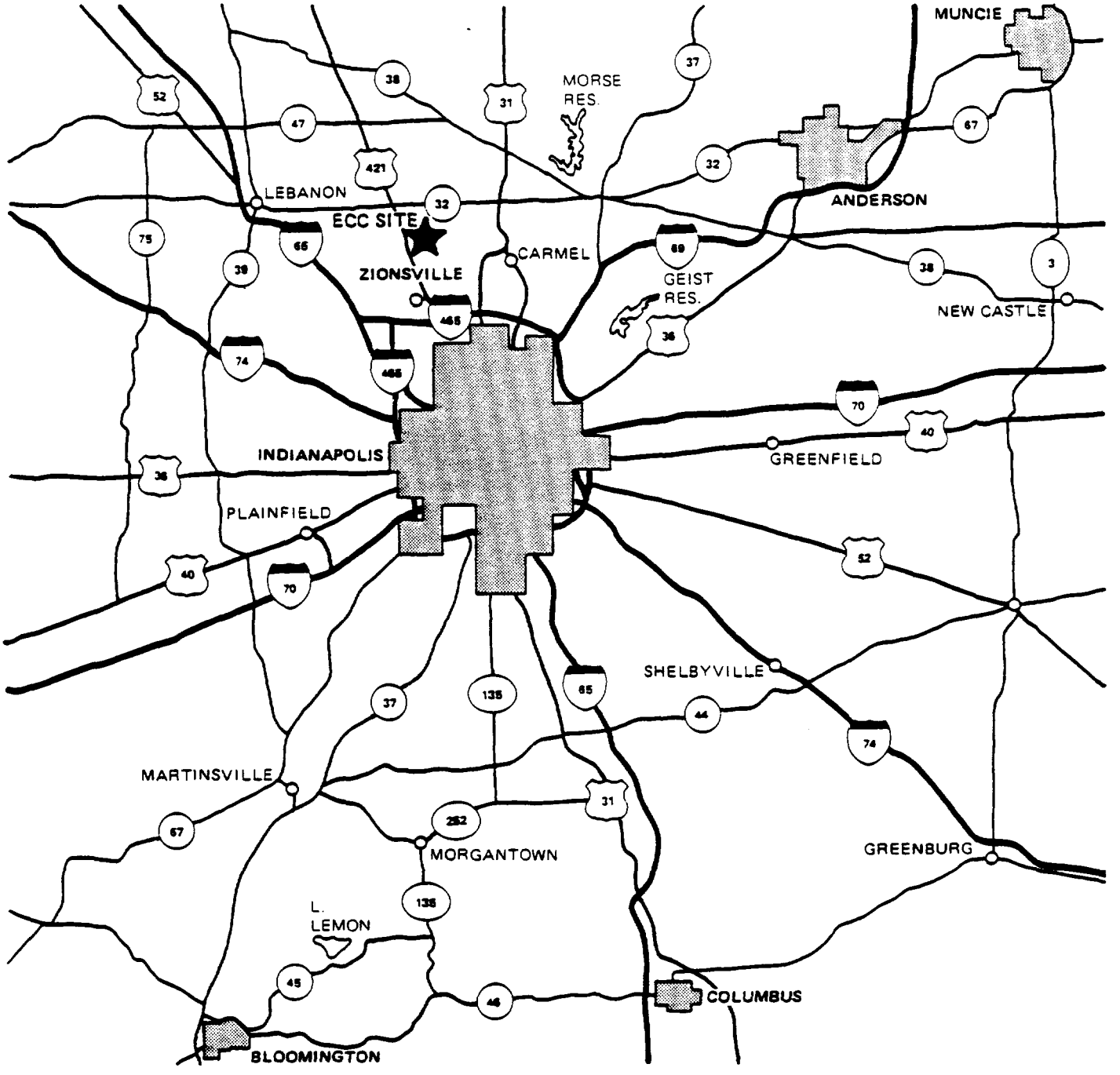
The ECC facility is bounded on the south and east by the landfill. A site map is shown in Figure 2-3. An unnamed ditch separates the two facilities along the east boundary. The site is bounded on the north and west sides by several residential homes, located within one-half mile of the facility.

On the site are about 25,000 drums, 47 bulk storage tanks, a cooling water pond, and process building and main office. Some of the drums are bulging, leaking, or otherwise damaged. They are stacked three and four high on a concrete pad (south storage area) and on the ground (north storage area). An earthen dike surrounds the immediate processing and storage area. A combination wood and stranded wire fence surrounds the entire site.

2.2.2 Site History

The Environmental Conservation and Chemical Corporation began operation in August of 1977 under a construction permit issued by the Indiana Air Pollution Control Department (APCD) on May 5, 1977. The company was engaged in the recovery/reclamation/brokering of primary solvents, oils and other wastes received from industrial clients. Waste products were received in drums and bulk tankers and prepared for subsequent reclamation or disposal. Reclamation processes included distillation, evaporation and fractionation to reclaim solvents and oil.

Two problems developed during the facility's operation:



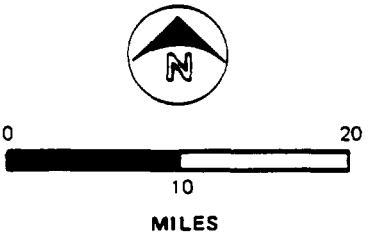


FIGURE 2-1
LOCATION MAP
ECC SITE

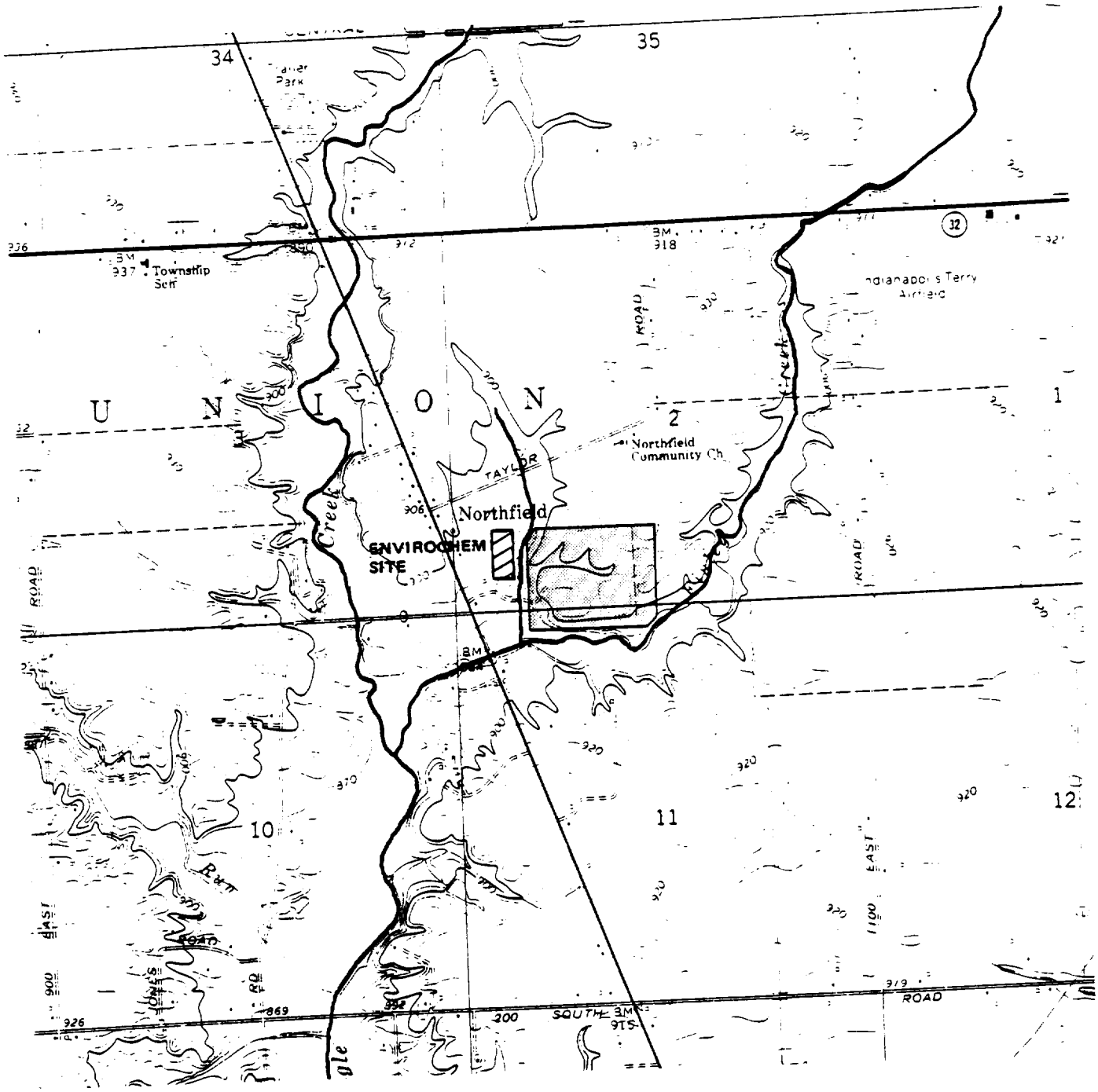


FIGURE 2-2
VICINITY MAP
ECC SITE

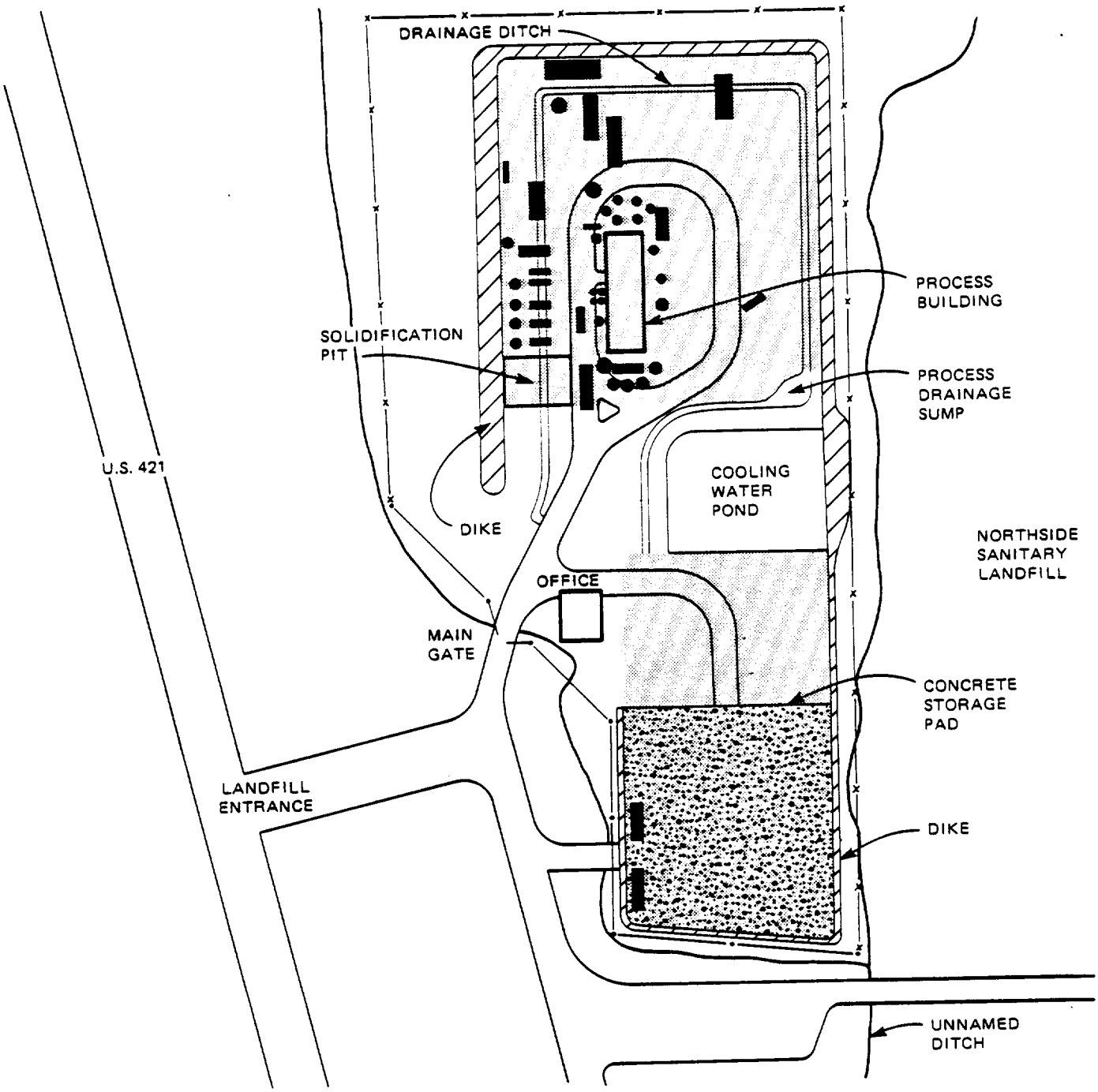


FIGURE 2-3
SITE MAP
ECC SITE

- The inability of the company to adequately dispose of wastewater and contaminated stormwater generated at the facility,

- The inability of the company to manage its drum inventory in a manner that did not pose a threat to the environment.

In an attempt to handle the wastes generated onsite, approval was sought by ECC to dispose of 5,000 gallons per day (gpd) of oil recovery wastes and 1,000 to 1,500 gallons per week of still bottoms at the Northside Sanitary Landfill. Approval to dispose of the still bottoms was granted (with conditions) by the SPCB on October 11, 1977; however, the request to dispose of the liquid waste from the oil recovery operations was denied.

Subsequently, the company sought other avenues of waste disposal. An agreement was reached between the Indiana State Board of Health (ISBH), ECC, and Northside Sanitary Landfill to allow disposal of oily wastes in the landfill with municipal refuse. Following expiration of this agreement in May 1979, ECC added units to process wastewater by distillation onsite. The product water was used as boiler makeup water.

On July 31, 1979, the ISBH received a report from a private citizen that an oil spill had occurred on Eagle Creek north of Zionsville. Immediate inspection revealed that the oil had originated from ECC and a minor amount from the Northside Sanitary Landfill. ECC agreed to take action to recover the oil. A followup investigation conducted on August 2, 1979 by the ISBH showed that ECC intentionally discharged process and cooling water from a storage lagoon into Finley Creek without a permit. ECC officials explained that due to heavy rains, stormwater pumped from the drum storage and loading areas to the cooling water pond caused it to overflow. Therefore, it became necessary to drain the excess water.

On September 18, 1979, the SPCB met to discuss the spill and discharge incidents at ECC. The board ratified an Agreed Order that included a fine and provisions to upgrade the methods of recordkeeping at the facility. In November 1979, the SPCB began a water sampling and analysis program at the site. Cooling water pond samples taken on November 2, 1979 were found to contain relatively high concentrations of arsenic, cadmium, chromium, lead, nickel, oil and grease, phenol, and zinc. Further testing of area wells and streams were inconclusive in documenting contamination of groundwater and surface water.

In December 1979, the U.S. EPA designated ECC as a potential hazardous waste site and began investigations under the

Hazardous Materials Emergency Response Program. By April 17, 1980, the ISBH submitted documentation to the Indiana Environmental Management Board (EMB) concerning ECC violations of the Environmental Management Act, the Air Pollution Control Law and the Stream Pollution Control Law. Specifically, the staff documented that:

- ECC posed a threat to pollute the environment.
- The company was burning chlorinated hydrocarbons and other solvents as boiler fuel without approval.
- Process water and contaminated stormwater were discharged without approval.
- Spills of oil and other objectionable substances occurred and were not reported or effectively cleaned up. Based on these violations, the EMB referred the matter to the Office of the Attorney General on May 15, 1980 for appropriate enforcement.

On February 9, 1981, an ECC employee died of exposure to toxic vapors after entering a solvent tanker.

A Consent Decree was issued on July 1, 1981, by the Boone County Circuit Court imposing a $50,000 civil penalty against ECC. Furthermore, the court placed ECC into receivership and prohibited the company from using Northside Sanitary Landfill for disposal of wastes. The decree gave ECC until November 1, 1982 to comply with environmental laws and regulations.

At this point, the ISBH began weekly monitoring of ECC's drum storage area to insure that action was being taken to reduce barrel inventory and improve storage facilities. The area was found to be extremely overcrowded with drums, some of which were damaged and leaking. Access was also dangerously poor. By October of 1981, construction of a concrete drum storage pad was underway and drum inventory had been reduced to an estimated 20,000 barrels. By December, the number of leaking, formerly leaking, popped top, corroded/damaged, and bungless/open top drums had been reduced to about 225. In February 1982, the EMB placed a freeze on drum shipments to the facility before the Boone County Circuit Court to assure compliance with the Consent Decree regarding storage of drums, location of materials onsite and in transit, and the removal of sludge.

On May 5, 1982, ECC was ordered by the court to close and environmentally secure the site for failure to reduce hazardous waste inventories. Two days later ECC's court receiver filed a closure plan with the Boone County Circuit

Court. By August 1982, ECC was found to be insolvent and planning work had begun for environmental revitalization, cleanup, and recycling of the site.

On September 21, 1982, the Office of the Attorney General held a conference with the ISBH and representatives from 60 generators of waste to propose a voluntary cleanup plan for the ECC site. The closure plan and settlement offer required generators to remove and dispose of wastes and pay $250/drum into a trust fund to be used for remaining surface/subsurface remedial measures. In return, generators would receive a limited release. In response to the offer, the generators entered into a loose coalition and hired Chemical Waste Management, Inc., to prepare a technical proposal for a complete surface cleanup. They then offered to pay for drum removal in return for a complete release. Negotiations are still underway.

In October 1982, Ecology and Environment/TAT assisted EPA personnel in sampling of the liquids in the cooling water pond and drum storage sections of the facility. Site investigations and discussion of surface cleanup plans continued through the months of November and December.

On January 20, 1983, an initial site visit was conducted by the REM/FIT contractor CH2M HILL, EPA, and ISBH personnel as a preliminary to preparation of the RAMP.

2.2.3 Remedial Actions to Date

The remedial actions to date have been to install a 4-foot wood and stranded wire fence around the perimeter of the site. No further remedial measures have been implemented.

2.2.4 Chronology

A chronology of the ECC site is presented in Appendix B.

2.3 HAZARDOUS MATERIALS CHARACTERIZATION

Hazardous materials are found in the following containments onsite:

- 47 bulk storage tanks with about 300,000 gallons of hazardous waste.
- About 25,000, 55-gallon drums.
- An estimated 1,000,000 gallons of contaminated water in a cooling water pond.
- An estimated 500,000 gallons of contaminated water in ponds on the north and south drum storage areas.

These quantities are estimates based on incomplete information.

Materials processed at ECC during its recovery/reclamation/brokering operations are listed in Table 2-1. Descriptions of these materials are presented in Table 2-2.

2.3.1 Bulk Storage Tanks

The bulk storage tanks are located mainly in the northern portion of the site surrounding the process building (see Figure 2-3). Known individual bulk tank storage volumes vary from 1,000 to 30,000 gallons. Table 2-3 is a partial bulk tank inventory. Bulk tank locations are identified in Figure 2-4. Of the remaining 19 tanks, at least 5 are tanker trucks that have been parked onsite. There are reportedly two buried tanks onsite.

Available test data indicate that sampling and analysis of the bulk storage tanks has been limited to one sample of a boiler fuel tank taken on May 6, 1980 by the ISBH. The fuel was composed of the following compounds:

Octane	6.2%
Acetone	13.3%
1,1,1-trichloroethane	1.6%
Methyl Ethyl Ketone	13.7%
Trichloroethylene	1.3%
Methyl Iso-butyl Ketone	3.0%
Toluene	18.4%
P-xylene	5.6%
M-xylene	20%
O-xylene	4.4%

Analysis for heavy metals found the following:

Cadmium	less than 1 ug/l
Chromium	25 ug/l
Lead	74 ug/l
Nickel	4 ug/l
Zinc	179 ug/l

2.3.2 Fifty-five Gallon Drums

Fifty-five gallon drums are stored in the north and south drum storage areas, generally stacked three to four high (see Figure 2-3). An inventory of drums was conducted on November 25, 1981, 6 months before the site was closed. Results of the inventory are shown in Table 2-4.

Sampling and analysis of drums has not been undertaken. The majority of drums, however, are reportedly labeled and manifested according to RCRA regulations. An ECC inventory of

Table 2-1
MATERIALS PROCESSED AT ECC

MATERIAL	PROCESS METHOD			ULTIMATE DISPOSAL		
	Distillation[a]	BTU Recovery	Fixation[b]	Distillates For Sale[c]	Incineration	Landfill
RECOVERABLE LIQUIDS						
Lacquer Thinner	X			X		
Paint Solvents	X			X		
Washup Thinner	X			X		
Chlorinated Solvents	X			X		
Ink Solvents	X			X		
Still Bottoms		X			X	
Scrap Paint		X			X	
Paint Resins and Pigments		X			X	
Scrap Glue		X			X	
Resin Additive		X			X	
Scrap Oil		X			X	
NONRECOVERABLE SOLIDS						
Paint Filters			X			X
Paint Solids			X			X
Vinyl Residues			X			X
Paint Booth Overspray Waste			X			X
Metal Hydroxide Sludges			X			X
Drum Bottoms			X			X
Settled Solids from Distillation			X			X

[a] Distillation on thin film unit.
[b] Fixation with sand, calcium, oxide, kitty liter or fly ash.
[c] Distillates sold, still botttoms disposed at secure landfill.

Source: ECC Records.

GLT90/16

Table 2-2 (page 1 of 2)

DESCRIPTIONS OF MATERIALS PROCESSED AT ECC

RECOVERABLE LIQUIDS

Lacquer thinner - A mixture of solvents composed of members of the ketone and acetate families used to dilute lacquers for coating surfaces.

Paint Solvent - Specific industrial solvents such as methyl ethyl ketone, toluene, xylene, etc., used in industries to thin paint, speed up or reduce drying time, etc.

Washup thinner - Mixtures of flammable solvents used to strip paint from spray guns, machine parts, etc.

Chlorinated solvents - Mixtures of nonflammable solvents such as tetrachloroethylene, methylene chloride, and trichloroethylene that are generally used for degreasing metals in industry.

Ink solvents - Mixtures of flammable solvents composed of members of the acetate and alcohol families used to remove dyes and inks in the printing industries.

Still bottoms - The remaining portion (sludge) of a material that has been processed on a distillation unit.

Scrap Paint - Outdated paint, paint that has been made incorrectly, or paint that will not meet a customer's needs.

Paint Resins & Pigments - Outdated resins and pigments used in the production of latex and enamel paints that will no longer meet quality standards.

Scrap Glue - Outdated glue, glue that has been made incorrectly or will not meet a customer's needs.

Resin additives - Plasticizers (nonvolatile compounds) and dispersion agents.

Scrap Oil - Used oils that have been contaminated with water, dirt, metal shavings, etc.

NONRECOVERABLE SOLIDS

Paint Fillers - Spent filters that have been contaminated beyond use.

Paint Solids - Solids that have settled out of old paint and will not disperse back into the paint solution.

Vinyl residues - Old vinyl resins that have hardened due to evaporation of solvents from the original mixture.

Overspray paint booth waste - A solid waste that consists of reacted, film-forming paint that has been scraped from a paint spraying process.

Metal hydroxide sludges - Sludges from the plating industry that contain metals tied to hydroxide groups.

Source: ECC Records.

GLT/90/21

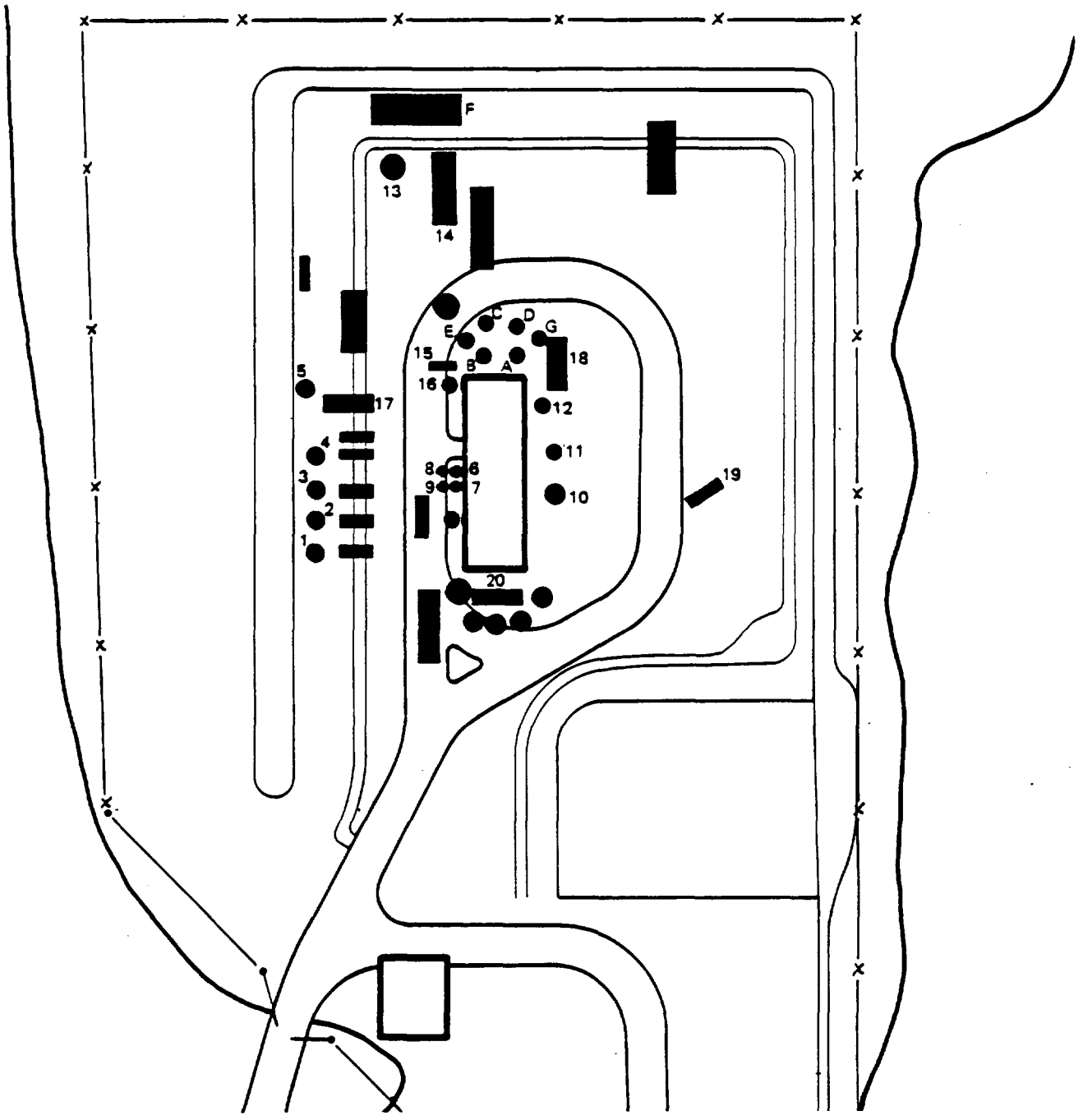
Table 2-3

BULK STORAGE TANK INVENTORY

Tank ID	Contents	Capacity (gal)
A	Oil Processing	10,500
B	Solvent Still	10,500
C	Solvent Storage	10,500
D	Oil Storage	10,500
E	Solvent Coalescer	5,000
F	Fuel Oil Product Storage	30,000
G	Fuel Oil Product Storage	13,000
1	Waste Solvent & Oil Storage	10,500
2	Waste Solvent & Oil Storage	10,500
3	Waste Solvent & Oil Storage	5,000
4	Waste Solvent & Oil Storage	5,000
5	Boiler Fuel Oil	2,000
6	Clean Solvent Storage	1,500
7	Clean Solvent Storage	1,500
8	Clean Solvent Storage	20,000
9	Clean Solvent Storage	20,000
10	Still Bottom Storage	15,000
11	Waste Solvent Storage	10,500
12	Still Bottom Storage	1,500
13	Waste Solvent Storage	3,000
14	Waste Solvent Storage	4,500
15	Solvent Drying Process	1,000
16	Solvent Drying Process	1,000
17	Fuel Oil Storage	10,000
18	Fuel Oil Storage	10,000
19	Fuel Oil Storage	10,000
20	Fuel Oil Storage	7,500

Source: ECC Records.

GLT90/19



LEGEND

0 BULK STORAGE TANK NUMBER

N

0 160

80

SCALE IN FEET

FIGURE 2-4
BULK STORAGE TANK LOCATION
ECC SITE

Table 2-4

ECC DRUM INVENTORY

Drum Location	DAMAGED OR OPEN TOP DRUMS						TOTAL
	Leaking	Formerly Leaking	Popped Top	Corroded/ Damaged	Bungless/ Open Top	Subtotal	Drums
DRUMS PLACED ON DIRT							
North Storage Area							9,166
Offsite							564
South Dirt Storage Area							3,876
Subtotal	20	10	31	48	35	144	13,606
DRUMS PLACED ON CONCRETE							
South Concrete Storage Area	14	29	9	22	5	79	9,565
TOTAL DRUMS	34	39	40	70	40	223	23,171

Source: ISBH, Dec 7, 1981.

GLT90/17

drum contents and generators is available in State and EPA files. ECC has reported that 14,000 of the drums contain 30 to 100 percent solids. A majority of the drums with liquid contents contain various solvents and thinners listed in Tables 2-1 and 2-2. It is estimated that roughly one-half of the drums contain some flammable liquids.

2.3.3 Cooling Water and Drum Storage Area Ponds

The cooling water pond is a rectangularly shaped basin in the central area of the ECC site (Figure 2-5). It receives surface runoff from the site and, as a result, has become contaminated. The pond has been sampled eight times from 1979 to 1982. Analytical results of several of these samples are shown in Table 2-5.

Contaminated water also exists in the north and south drum storage area. The approximate location of these ponded waters is shown in Figure 2-5. The ponds are about 2 feet deep at their deepest points. They have been sampled six times from 1979 to 1982. Table 2-5 presents analytical results for two of the six sampling dates.

Also shown in Table 2-5 are EPA ambient water quality criteria (WQC) for the substances found in the cooling pond or ponded waters.

2.4 ENVIRONMENTAL SETTING

2.4.1 Physiography

Union Township, the location of the ECC site, is included in the Tipton Till Plain physiographic unit as defined by Malott (1922). The Tipton Till Plain is an extensive flat to gently rolling area formed on glacial drift deposited during the Wisconsin glacial advance.

The glacial drift deposited in the area surrounding the site consists of Wisconsin ground moraine and glacial outwash. Silt and clay with intertill sand and gravel seams comprise the ground moraine, while the outwash deposits are primarily composed of sand and gravel.

The site is bounded by an earth berm. It slopes gently toward the southeast with site elevations ranging from approximately 880 to 890 feet above mean sea level. Along the eastern boundary, the site slopes eastward toward an adjacent drainageway.

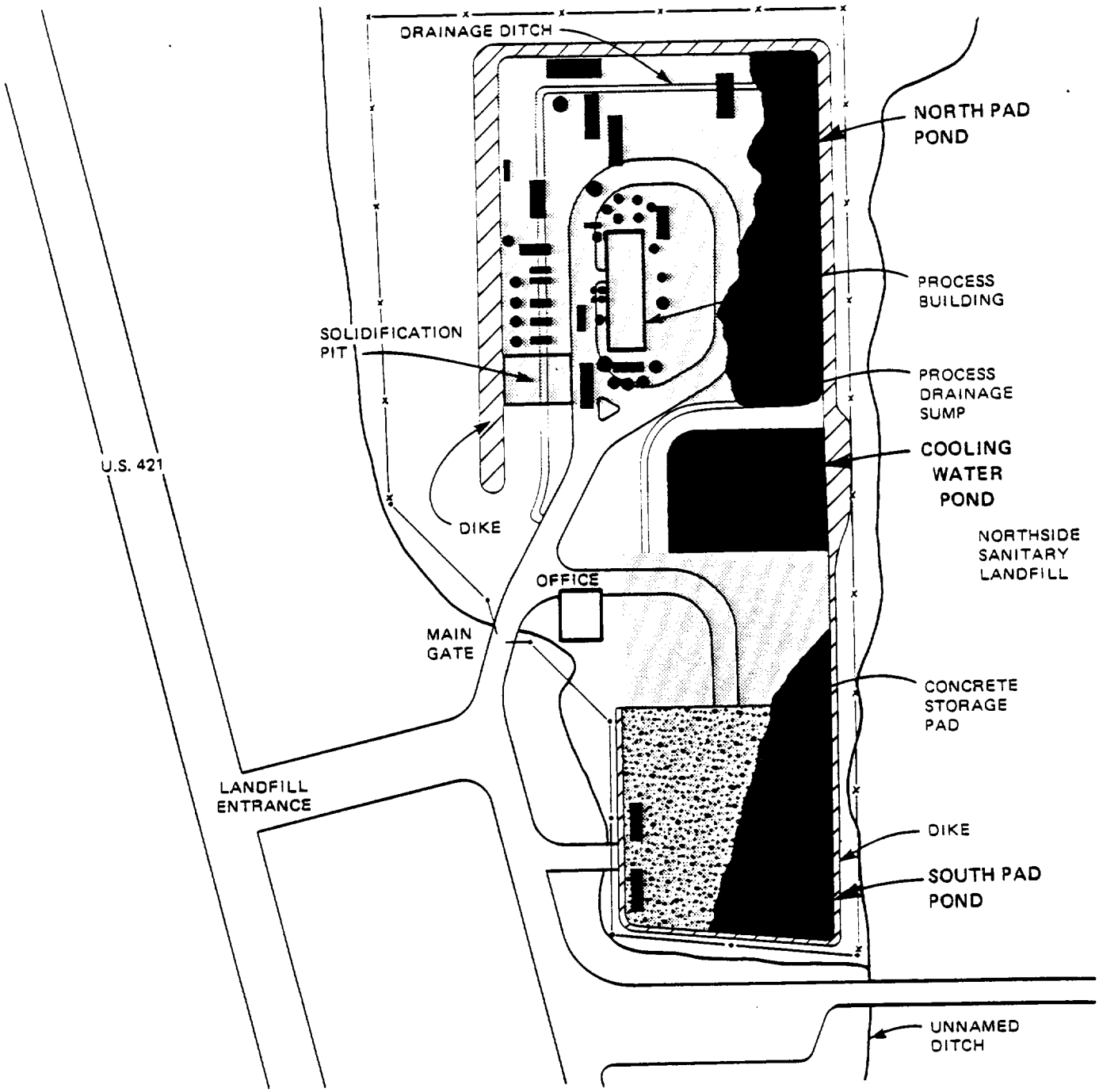


FIGURE 2-5
LOCATION OF COOLING WATER AND DRUM STORAGE AREA PONDS
ECC SITE

Table 2-5

CONTAMINANT CONCENTRATIONS AND WATER QUALITY CRITERIA FOR SUBSTANCES FOUND ONSITE (ug/l)

	PONDED WATER SAMPLES ANALYSIS RESULTS						EPA AMBIENT WATER QUALITY CRITERIA			
	Cooling Water Pond			Drum Storage Area Ponds			For Protection of Human Health[1]		For Protection of Aquatic Life[2]	
Substance	04/10/80	08/09/82	10/18/82	South 04/10/80	South 10/18/82	North 10/18/82	Toxicity	Carcinogenicity	Acute	Chronic
1,1,-Dichloroethane		17					NCA		NDA	NDA
1,1,1-Trichloroethane	6,821	831	1,322		621	1,266	18,400		52,800	NDA
1,1,2-Trichloroethane	16							6.0	36,000	9,400
1,1-Dichloroethylene	152	95	2,848					0.33	30,300	NDA
1,2-Dichloroethylene	259	2,022		48	1,541	2,766	NCA		135,000	NDA
Perchlorethylene	1,297	12	0.6		1,176	71		1.7	5,280	840
Trichloroethylene	3,873	191	673		1,176	1,398		6.0	45,000	NDA
Dichloromethane	5,470	1,329	3,908	485	3,873	5,548		1.9	193,000	NDA
Trichloromethane		21						1.9	28,900	1,240
Trichlorofluoromethane				14				1.9	NDA	NDA
Toluene	2,700			935			14,300		17,500	NDA
Nitrophenol	270						NCA		NDA	NDA
Pentchlorophenol	38			103	5		1,010		55	3.2
Phenol	1,930	15,000	396		460	325	3,500		10,200	2,560
2,4-Dimethylphenol		260	251	349	236	121	NCA		2,120	NDA
2,4,6-Trichlorophenol			5		4	3		12	720	720
Benzene						463		6.6	5,300	NDA
Methylbenzene		858	974		1,035	1,132				
Ethylbenzene		110		1,188			1,400		32,000	NDA
1,3-Dimethylbenzene		98								
1,2 & 1,4-Dimethylbenzene		79								
1,3-Dichlorobenzene			0.5		17	92	400		5,020	1,510
1,4-Dichlorobenzene			0.4		15	86	400		1,120	763
1,2-Dichlorobenzene			0.5	27	18	97	400		2,000	2,000
Diethylphthlate	27	86	47	433	32		350,000		52,100	NDA
Dimethylphthlate	311	240	175	513	169	164	313,000		33,000	NDA
Butylbenzylphthalate			1,122		3,277	2,457	NCA		3,300	220
Di-N-Butylphthalate		76	29		87	135	34,000		940	NDA
Napthalene			12		16	29	NCA		23,000	620
Isophorone		3,200					5,200		NDA	NDA
P-Chloro-M-Cresol				91		4	NCA		NDA	NDA

NCA = Insufficient data available upon which to derive a criterion.

NDA = No toxicity data available.

[1] 1980 EPA Ambient Water Quality Criteria for the protection of human health from the toxic properties of a pollutant ingested through water. Contaminated aquatic organisms assume a daily ingestion of 2 liters of water and 6.5 grams of potentially contaminated fish products.

[2] No criteria available. Values are lowest reported toxic concentrations in freshwater

GLT90/18

2.4.2 Geology

The bedrock beneath the ECC site and the surrounding area are middle Devonian age carbonates which dip gently to the southwest toward the Illinois basin.

About 180 feet of unconsolidated materials overlie bedrock at the site. These deposits are primarily Wisconsin age glacial tills composed of silty clay, clayey silt, and sandy clay. Surficial glacial till is about 20,000 years old, and is part of the Cartersburg Till Member of the Trafalgar Formation (Wayne 1963). According to West (1982), the glacial till present in the vicinity of the Northside Sanitary Landfill is generally overconsolidated silty clay with a low permeability (10^{-8} to 10^{-9} cm/sec).

Scattered intertill deposits of sand, gravel, and silty sand are present at varying elevations in the area. These permeable materials are apparently of glaciofluvial origin and provide a source of groundwater to residential wells on adjacent properties. These intertill deposits, with the exception of significant sand and gravel deposits occurring at an elevation of about 725 feet, are thin and laterally discontinuous. The log from a groundwater monitoring well, located in the south central portion of the site, indicates that this portion of the site is underlain by alternating zones of fine and coarse material (See Figure 2-6).

Excavations conducted by the ISBH along the eastern site boundary, however, indicate that significant thicknesses of coarse materials exist within 0 to 14 feet of the ground surface.

The dominant soil identified at the site is the Miami Clay loam. This soil is well drained and moderately permeable. However, runoff is rapid and erosion potential is high.

On March 3, 1979, the ISBH bored and sampled the dike separating the ECC holding pond from the Finley Creek drainageway. Levels of contaminants found in the leachate from a soil sample collected at a boring depth of 2 feet were:

o	Chemical oxygen demand	30,000 mg/kg
o	Lead	< 1 mg/kg
o	Mercury	65 mg/kg
o	Phenol	0.3 mg/kg

On October 6, 1981, the ISBH collected soil samples from the storage area located on the northern portion of the ECC site. An analysis performed on these samples identified several organic and inorganic contaminants. Maximum levels of contaminants found in these soil samples were:

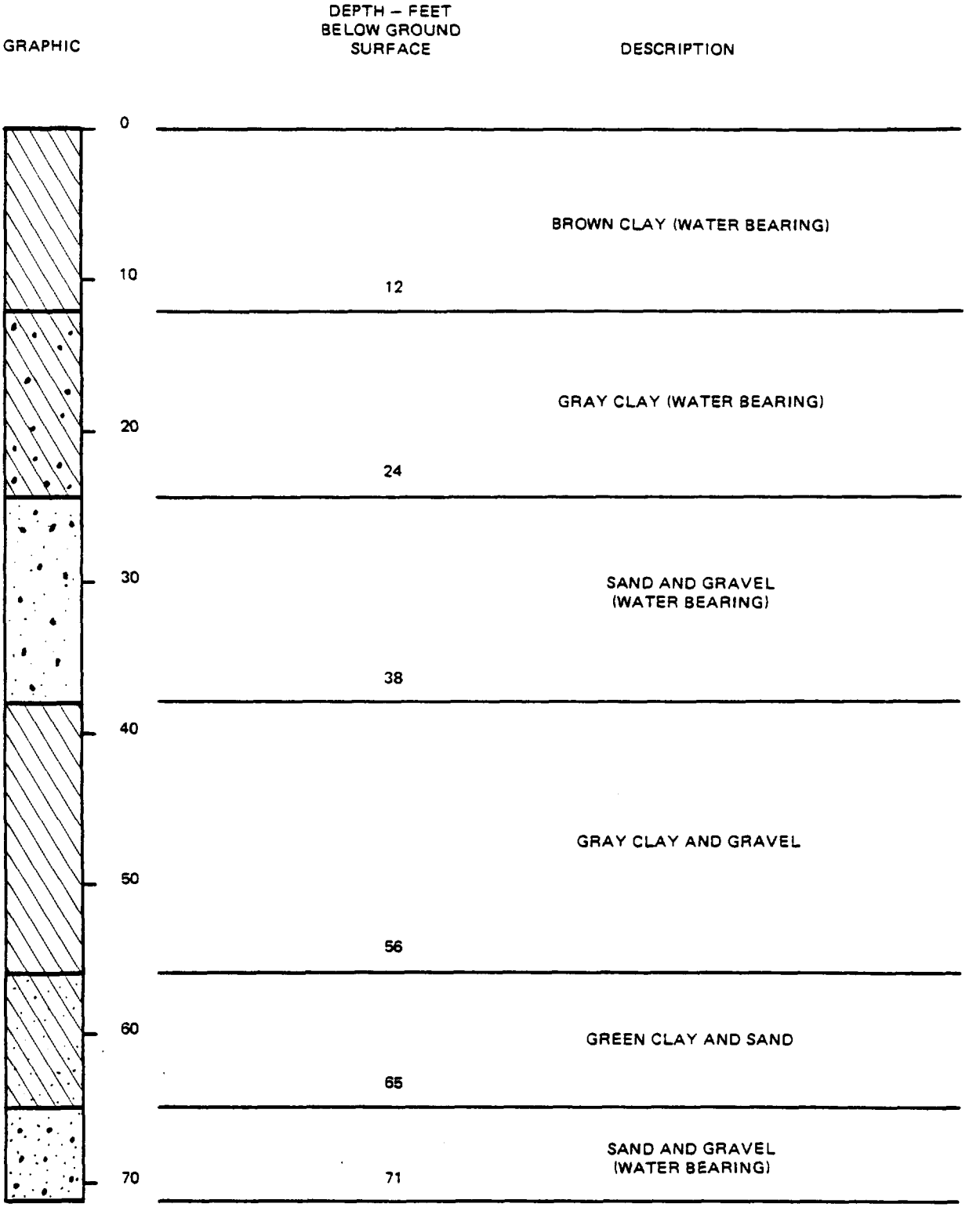


FIGURE 2-6
ECC GROUNDWATER MONITORING WELL LOG
ECC SITE

o	Barium	0.3 mg/kg
o	Cadmium	0.014 mg/kg
o	Total Chromium	0.86 mg/kg
o	Lead	0.63 mg/kg
o	Mercury	0.0007 mg/kg
o	Methylene Chloride	1,670 mg/kg
o	Trichloroethylene	45,900 mg/kg
o	1,1,1-Trichloroethane	13,200 mg/kg
o	Toluene	17,200 mg/kg
o	Ethylbenzene	4,100 mg/kg
o	Methyl Ethyl Ketone	35,600 mg/kg
o	Xylene	12,900 mg/kg

2.4.3 Hydrology

A well-developed drainage pattern exists in the area surrounding the ECC site. The principle surface drainage features are Eagle Creek and Finley Creek, an associated tributary. Two minor surface drainage features are located adjacent to the site. An unnamed ditch flows south along the eastern site boundary and converges about 1,000 feet downstream from the site with Finley Creek. The other unnamed ditch flows southwest along the western and southern site boundaries before discharging near the southeast site corner, into the unnamed tributary of Finley Creek. Finley Creek converges with Eagle Creek about one-half mile southwest of the site. Eagle Creek then flows south for about 10 miles before discharging into the Eagle Creek Reservoir. The site is located outside the 100-year flood plain.

Natural surface water runoff from the area surrounding the site flows toward the unnamed tributary of Finley Creek or toward Finley Creek. The ECC site has a bermed perimeter to prevent the escape of surface water runoff. The runoff that occurs is channeled towards the cooling water pond located along the eastern site boundary.

Contamination of surface water offsite has been determined on many occasions by the ISBH. Levels of some organic compounds found in the unnamed drainageway were:

o	Methylene Chloride	350 ug/l
o	1,1-Dichloroethane	26 ug/l
o	Tetrachloroethylene	2 ug/l
o	Methyl Ethyl Ketone	270 ug/l

Stream sediment samples collected offsite also indicated contamination downstream from the ECC and Northside Sanitary Landfill sites. A March 10, 1981 investigation by the ISBH found elevated downstream heavy metal levels in the unnamed

drainageway adjacent to the eastern site boundary. Levels of metals found in the downstream sediments were:

o	Copper	20,000 ug/kg
o	Lead	89,000 ug/kg
o	Mercury	40 ug/kg
o	Nickel	14,000 ug/kg

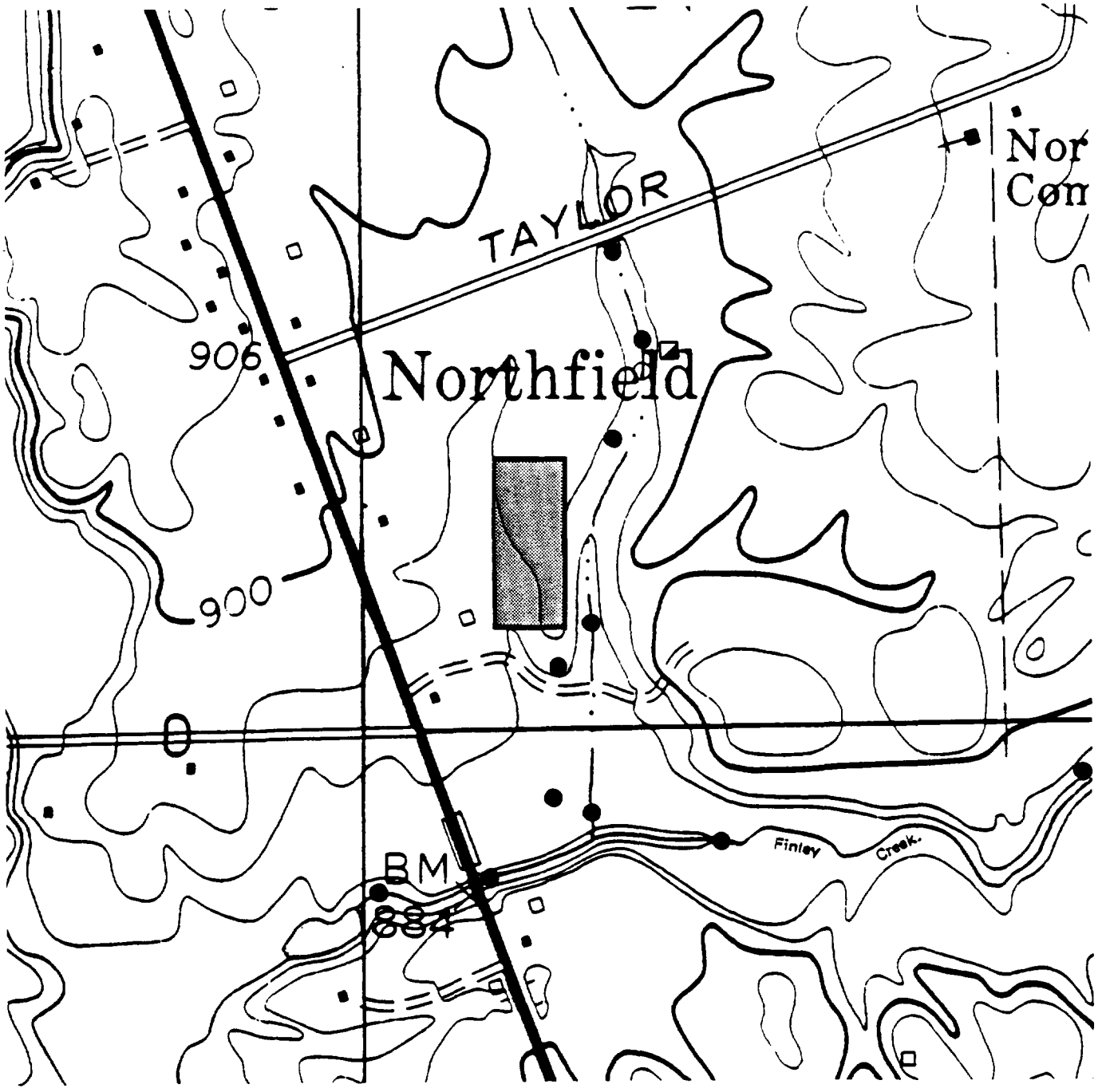
The locations of surface water and stream sediment sampling by ISBH are shown in Figure 2-7. An analysis of bottom sediments in the Eagle Creek drainage system, conducted by the U.S. Geological Survey on June 8, 1979, also indicated some contamination downstream from the ECC and Northside Sanitary Landfill sites. Relatively high concentrations of strobane, a pesticide residue related to toxaphene, were found in the bottom sediments of Finley Creek, and the unnamed tributary downstream from the sites.

2.4.4 Geohydrology

ECC is located within an area of moderate groundwater use. The principle aquifers of Boone County are sand and gravel zones within the glacial drift, outwash deposits of sand and gravel along Eagle Creek, and limestone bedrock beneath the glacial drift. The most productive wells are in the sand and gravel zones of the glacial drift and in the outwash deposits. In the area surrounding the site, residential wells primarily obtain groundwater from the sand and gravel zones in the glacial drift. These residential wells are generally 100 to 170 feet deep, but several are located in aquifers only 40 to 50 feet below the ground surface.

The sand and gravel aquifers within the glacial drift are confined in nature and generally discontinuous. A well log, from the south central portion of the site, indicates the presence of two sand and gravel aquifers within 70 feet of the ground surface. The depths to the top of these aquifers are 24 and 65 feet. The apparent upper aquifer groundwater flow directly beneath the site area is southeast towards Finley Creek, based upon the approximate static water level contours shown in Figure 2-8. The creek may be acting as a local migration feature since the groundwater gradient on the east side of the creek is to the northwest toward the creek.

Groundwater samples from surrounding residential wells have been collected and analyzed on several occasions by the ISBH. On September 5, 1980, five residential wells were sampled and subsequently analyzed for heavy metal content. None of the groundwater samples contained heavy metals in concentrations greater than the detection levels.



LEGEND

- ● APPROXIMATE WATER AND SEDIMENT SAMPLE SITES
- ◪ SEDIMENT SAMPLE ONLY

NOTE: Two sites located off map and upstream on Finley Creek.

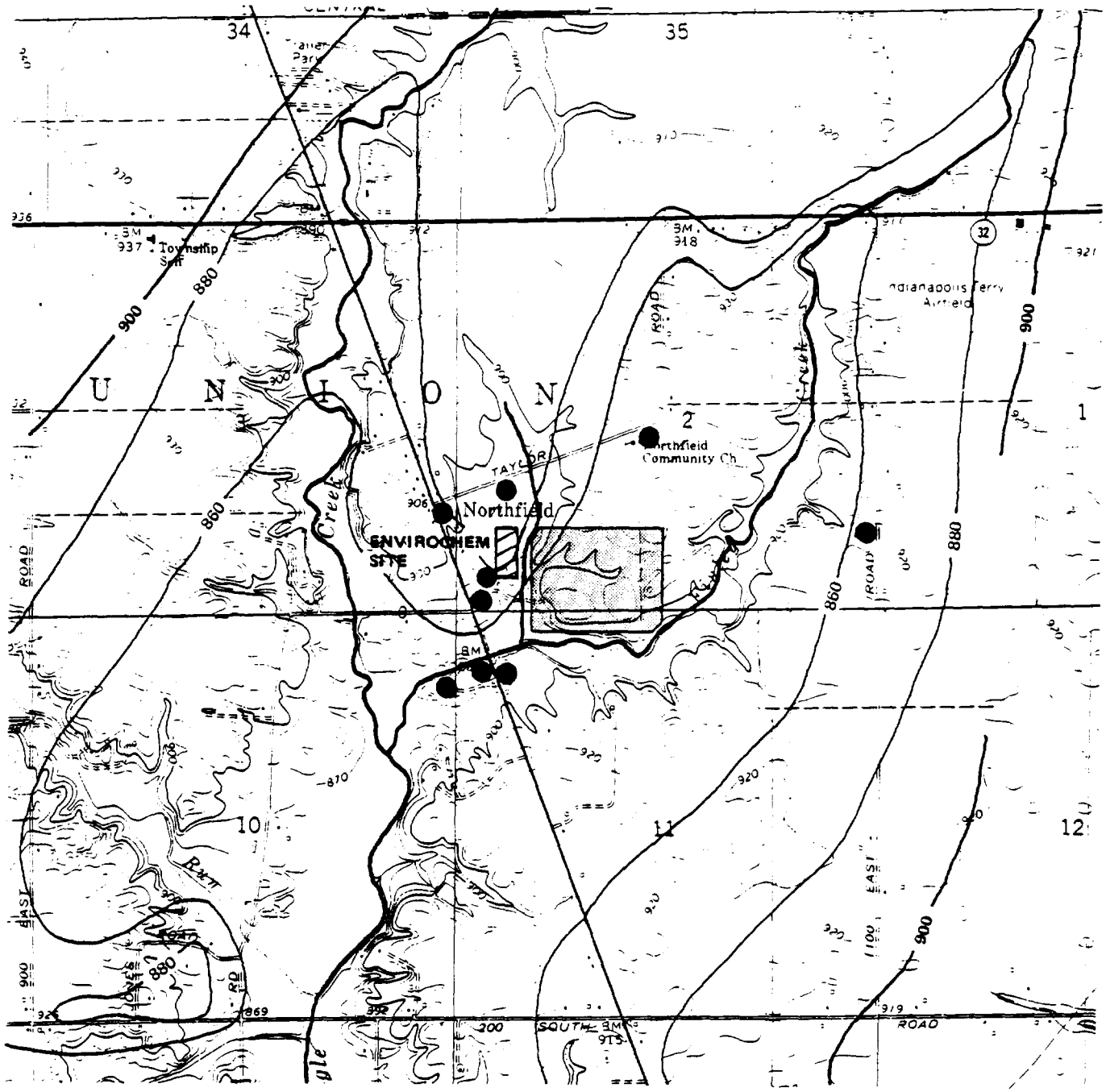
N

0 1000

500

SCALE IN FEET

FIGURE 2-7
ISBH WATER AND SEDIMENT SAMPLE LOCATIONS
ECC SITE



LEGEND

- NORTHSIDE LANDFILL
- SITE
- APPROXIMATE STATIC WATER LEVEL CONTOURS
- RESIDENTIAL WELL LOCATION

N

0 4000

2000

SCALE IN FEET

SOURCE: (1) *Water level contours from Indiana State* Board of Health correspondence from James King to Northside Sanitary Landfill. (Oct. 11, 1977)

(2) USGS topographic map, 1969.

FIGURE 2-8
APPROXIMATE STATIC GROUNDWATER LEVEL CONTOURS AND SAMPLED RESIDENTIAL WELLS
ECC SITE

A more extensive investigation of surrounding residential groundwater quality was conducted by the ISBH on March 5, 1981. Included among the nine wells sampled was the 115 foot deep ECC office well. The results of the laboratory analysis involving heavy metals, cyanide, fluoride, and organic chemicals did not indicate any contamination by these components. The locations of the residential wells sampled are shown in Figure 2-8.

In addition to the residential well sampling, the ISBH sampled groundwater from two onsite wells on March 17, 1981. These wells were 38 and 71 feet deep. The analysis of the sample from the shallower well indicated the presence of several organic compounds, but no heavy metals were found in concentrations greater than the detection levels. The organic contaminants found in the shallower groundwater sample were methylene chloride (5.7 mg/l), 1,1-dichloroethane (950 mg/l), and trichloroethylene (10 mg/l). Groundwater from the deeper ECC well showed no sign of organic chemical or heavy metal contamination, except for high levels of strontium, the significance of which is unknown at this time.

On November 29, 1982, the ISBH sampled groundwater from five monitoring wells in the area around the Northside Sanitary Landfill and ECC. The analysis produced no unusual inorganic results, however, several organic chemicals were present in four of the five samples. Among the organic chemicals present were:

o	1,1-Dichloroethane	160 mg/l
o	Trans-1,2-Dichlorethylene	580 mg/l
o	Methyl Ethyl Ketone	2,600 mg/l

2.4.5 Air Quality

Climate

The following information was obtained from the soil survey of Boone County, Indiana; the original source of the information is the National Weather Service, U.S. Department of Commerce. Table 2-6 shows the temperature and precipitation data recorded at Whitestown, Boone County (about 4 miles southeast of the site), from 1896 to 1968. July is generally the warmest month, with temperatures reaching 90°F or greater, on an average of 11 days a year.

The average annual precipitation, based upon data from 1896 to 1968, is 38.8 inches. The greatest amount of precipitation usually occurs in late spring and early summer. Thunderstorms occur on an average of about 44 days of each year and represent the primary source of summer precipitation. On

Table 2-6
TEMPERATURE AND PERCIPITATION DATA

(All data from Whitestown, Boone County. Elevation 829 feet. Period of record, 1896 to 1968)

Month	Temperature				Precipitation				
						One year in 10 will have—			
	Average daily maximum	Average daily minimum	Average monthly maximum	Average monthly minimum	Average total	Less than—	More than—	Days with snow cover of 1 inch or more	Average depth of snow on days with snow cover of 1 inch or more
	°F.	°F.	°F.	°F.	In.	In.	In.		In.
January	36	19	56	−5	2.9	1.0	5.3	10	3
February	38	20	59	−1	2.1	.8	4.0	6	3
March	49	29	71	10	3.9	1.7	7.0	2	3
April	62	39	81	23	3.8	1.9	6.3	(1)	2
May	73	50	88	34	4.2	1.8	7.4	----------	----------
June	83	59	94	44	4.0	1.7	6.4	----------	----------
July	87	62	96	49	3.4	1.3	5.9	----------	----------
August	85	60	95	47	3.1	1.3	4.9	----------	----------
September	77	53	91	36	3.2	.9	5.7	----------	----------
October	66	42	82	26	2.8	.9	4.9	(1)	2
November	50	32	70	14	2.8	1.3	4.5	1	2
December	38	22	58	1	2.6	.9	5.3	7	3
Year	62	41	[2] 98	[3] −10	38.8	31.2	46.5	26	3

[1] Average less than half a day.
[2] Average annual highest temperature.
[3] Average annual lowest temperature.

SOURCE: Soil survey of Boone County, Indiana, USDA, SCS, 1975.

the average, at least 1 inch of snow is on the ground 26 days a year. However, many winters have very little snow.

Wind is predominantly from the southwest, but during the winter sometimes the prevailing wind is from the west or northwest. Wind velocities 20 feet above the ground surface, average about 11 miles per hour in the spring and 7 miles per hour in late summer.

Site Air Quality

Air quality measurements at and around the ECC site are unavailable. However, a local resident complained to the APCD about heavy offensive odors eminating from the vicinity of the Northside Sanitary Landfill and ECC on the evening of September 27, 1982. Employees of the APCD investigated the complaint, but they could not determine the cause or source of the odors.

During the RAMP site visit of January 20, 1983, slight odors could be detected. Measurements of organic vapors with an HNU photoinization detector showed levels 1 to 2 times greater than background levels.

2.4.6 Ecology

The ECC site is in a rural cropland area, with some woodlands associated with drainageways. Corn, soybeans, small grain, and hay are the main crops on the nearly level and gently sloping soils. The woodlands are dominated by hardwoods, such as swamp white oak, ash, and cottonwood.

Whitetail deer, squirrel, raccoon, and thrushes inhabit the wooded areas. Quail, cottontail, pheasant, and many types of songbirds live in the farmed and open areas. The fish population of Eagle Creek consists primarily of white sucker, rock bass, longear sunfish, stripped shinner, stoneroller, creek chub, and bluntnose minnow. A few migrating waterfowl pass through the county in fall and spring. Mallards and black ducks are the most numerous.

During the summer of 1978, an assessment of the fish populations of several central Indiana creeks, including Eagle Creek, was conducted by J. Gammon and others from the Depauw University Department of Zoology. One study location was situated on Finley Creek, directly downstream from the ECC site and Northside Sanitary Landfill. This location consistently showed low-standing crop values. Depressed diversity and abundance index values were also noted for this portion of Finley Creek.

Potential bioaccumulation of contaminants by organisms in the Finley Creek drainageway was investigated by the ISBH. From April 24, 1981 to June 9, 1981, freshwater mussles (Lamsilis radiata siloquoides) were suspended in Finley Creek and the tributary adjacent to the ECC site. The four placement locations are shown in Figure 2-9. Lead, mercury, silver, PCB, aldrin, DOT, heptachlor, diazinon, strobane, and malathion were not present above the normal detection levels. The results of the study did not indicate any drastic differences in contaminant accumulation among the four sample locations.

2.4.7 Socioeconomics

The population of Union Township has grown from 848 in 1960 and 984 in 1970 to 1,637 in 1980.

The area surrounding the site is largely undeveloped. Zoning to the east and south of the site is agricultural, while to the west and north it is residential. Approximately 50 residences are located within 1 mile of the site. Adjacent to the eastern site boundary is the Northside Sanitary Landfill.

During the February 4, 1981 meeting, the Boone County Area Plan Commission considered rezoning the land directly north of the landfill to agricultural. Minutes from this meeting indicated that several neighboring residents are concerned about contamination of the local groundwater by ECC or the landfill, and about reduced property values.

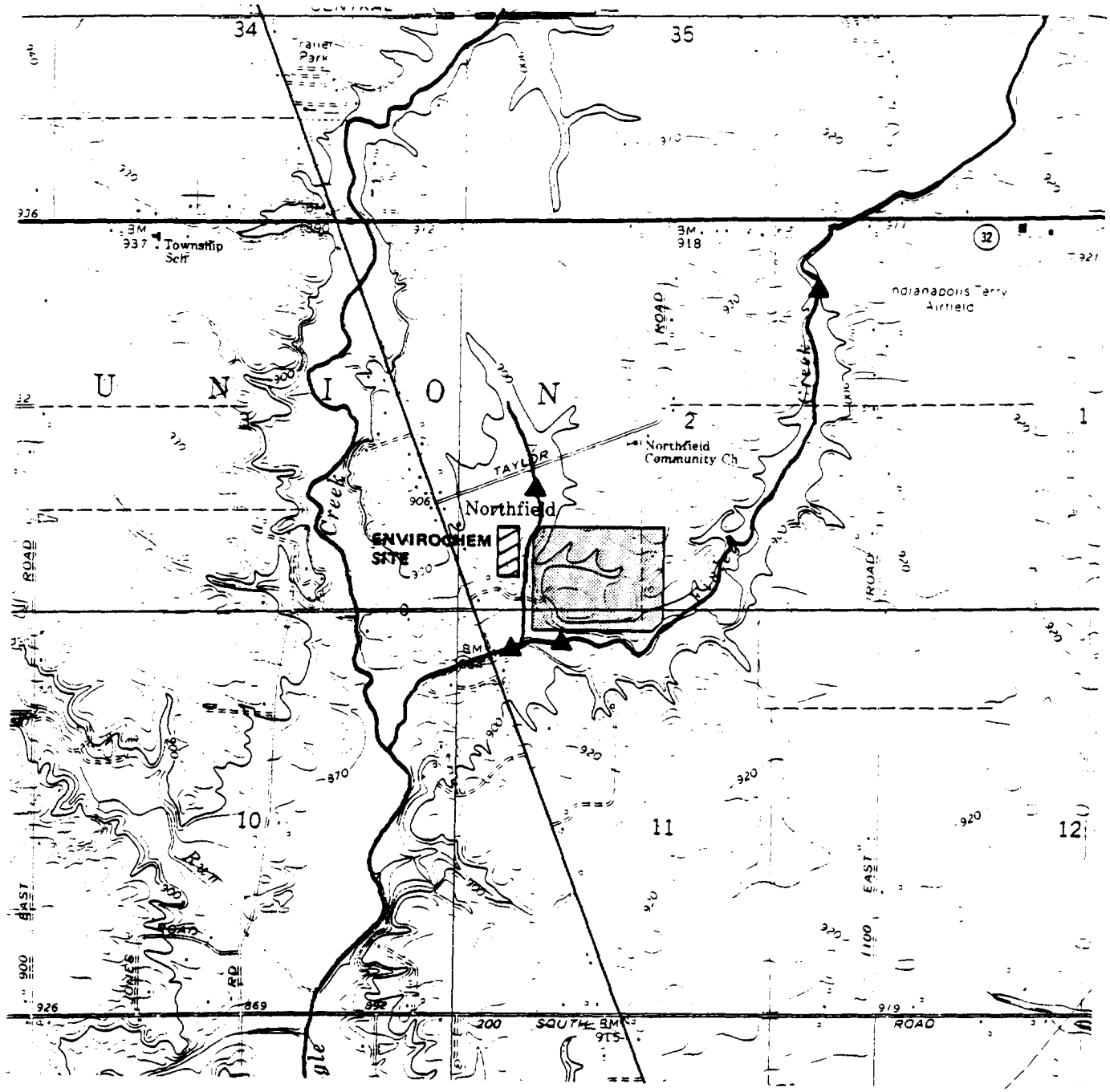
2.5 ASSESSMENT OF POTENTIAL IMPACTS

2.5.1 Public Health and Safety

Public health and safety could be adversely affected due to any of the following conditions at the ECC site:

- Fire hazard
- Surface water contamination
- Groundwater contamination
- Air pollution

The most significant threat to public health and safety is the presence of large volumes of ignitable wastes onsite. Nearly 150,000 gallons of bulk storage wastes and 500,000 gallons of drum wastes are ignitable. A fire could begin onsite through the mixture of incompatible wastes from leaking drums. The resulting fire could cause the generation of toxic fumes. Contaminants could be released into Finley Creek and ultimately the Eagle Creek Reservoir, a major source of drinking water for the city of Indianapolis. Fire fighting actions could lead to increased risks of offsite



LEGEND

- NORTHSIDE LANDFILL
- SITE
- STUDY SITES

N

0 4000

2000

SCALE IN FEET

FIGURE 2-9
SITE LOCATIONS FOR
BIOACCUMULATION STUDY
ECC SITE

contamination through the discharge of large amounts of fire-fighting water.

Onsite and offsite surface water contamination has been documented by the ISBH. Continued overflow of the contaminated waters may lead to the contamination of the downstream Eagle Creek Reservoir. Bioaccumulation affects may also occur as a result of pollutants in surface waters and sediments, though the mussel study by ISBH suggests this may not be a problem.

The extent of groundwater contamination onsite is unclear due to the lack of data. However, the potential for groundwater contamination is high due to the activities conducted onsite. Residential wells could be affected by a migrating contaminant plume. Contamination of Finley Creek is also possible.

Air pollution from the site may be a threat to public health, though data on specific contaminants is lacking. Vapors from the many volatile substances onsite or dusts blown up from contaminated soils could be transported to nearby residences.

The poor condition of the fence surrounding the site allows access to the area by animals or people. It is possible that domestic dogs have been onsite and may be carrying contaminants into homes. Trespassers onsite would face hazards from poorly stacked barrels and the contaminated waters and soils. A danger exists that a fire would be started by someone unaware of the easily ignitable contents of many of the drums and tanks.

2.5.2 Environment

Overflows of the cooling water ponds and the existence of an outfall pipe from the south barrel storage area have been documented. Continued overflows of the cooling water pond are likely during the spring and summer months. Gammon has speculated that contaminants from the ECC site may be contributing to the adverse effects on diversity and abundance of aquatic organisms found in Finley Creek. In addition to adverse effects on aquatic life, numerous trees surrounding the site have been damaged or killed. Effects on plant life are expected to be confined to the immediate vicinity of the site.

Terrestrial life may be adversely affected by contamination when drinking the water, feeding on vegetation or other animals, or by direct contact with soils.

2.5.3 Socioeconomics

The presence of a hazardous waste site in an agricultural and expanding residential area 10 miles from the City of Indianapolis could have significant adverse socioeconomic impacts. These impacts might include reduced property values and impairment of surrounding agricultural businesses. Contamination of the Eagle Creek Reservoir could greatly affect area socioeconomics either directly through the lowered availability of water for drinking and industrial use, or indirectly by relocation of city and suburban residents induced by fears and psychological stress because of potentially contaminated water.

2.6 DATA LIMITATIONS

The following data limitations were noted in the development of this RAMP:

- The existing inventory of drums, tanks, cooling pond and ponded waters onsite is incomplete.
- No contingency plan is available for responding to a fire and/or explosion onsite.
- Air quality at the site has not been analyzed.
- A comprehensive list of the primary groundwater wells neighboring the site and particularly south of the site is not available .
- Topographic data for the site is limited to USGS 10-foot contour intervals.
- A detailed hydrogeologic study for the site and surrounding area is not available.
- Data on the degree and extent of groundwater contaminants is incomplete.
- The degree and extent of surface water and sediment contamination is not clearly defined.
- The degree of contamination of stormwater runoff is not defined.
- Data on the degree and extent of soil contamination and soils percolation properties are incomplete.

References

Malott, C.A. 1922. Physiography of Indiana: in Handbook of Indiana Geology, Part II, Indiana Department of Conservation.

Wayne, W.J., 1963. Pliestocene Formations in Indiana: Indiana Geological Survey Bulletin 25, 85p.

GLT90/4

3.0 REMEDIAL ACTIVITIES

3.1 REMEDIAL ACTION PLAN

3.1.1 Overall Approach to Site

The ECC site is a threat to neighboring residences and industries and to downstream surface water and downgradient groundwater supplies. Substantial efforts are required to provide adequate protection of public health, welfare and the environment. This RAMP has been prepared to assess available data for the ECC site and identify the type, scope, sequence and schedule of remedial projects that may be appropriate. The State of Indiana and the U.S. EPA have concurred on the need for additional studies to assess the extent of soil, surface water and groundwater contamination, and the nature of the hazardous materials stored onsite. A feasibility study will follow the remedial investigations and will determine the cost-effective remedial measures for the ECC site.

3.1.2 Master Site Schedule

A master schedule for the initial remedial measures and the RI/FS activities at the ECC site is shown in Figure 3-1. This schedule is predicated upon a number of assumptions that are noted on the chart. Actual project developments will cause individual elements to shift chronologically.

3.1.3 Sequencing, Timing and Correlations of Project

Figure 3-2 presents a time schedule for RI/FS activities. Project duration has been established to be about 1.5 years, based on the assumption of a 1-year (maximum) groundwater sampling and analysis program (four quarterly samples). The bulk of the project activities can be completed within a time period of 18 months or less. The critical tasks requiring timely completions are:

- Sampling and analysis of local wells to establish or obviate the need for additional action regarding the health and safety of local residents.
- Sampling and analysis of the cooling water pond contents and treatment of the water before spring runoff.
- Inspection, inventory and removal of all ignitable and extremely hazardous wastes and damaged drums immediately.

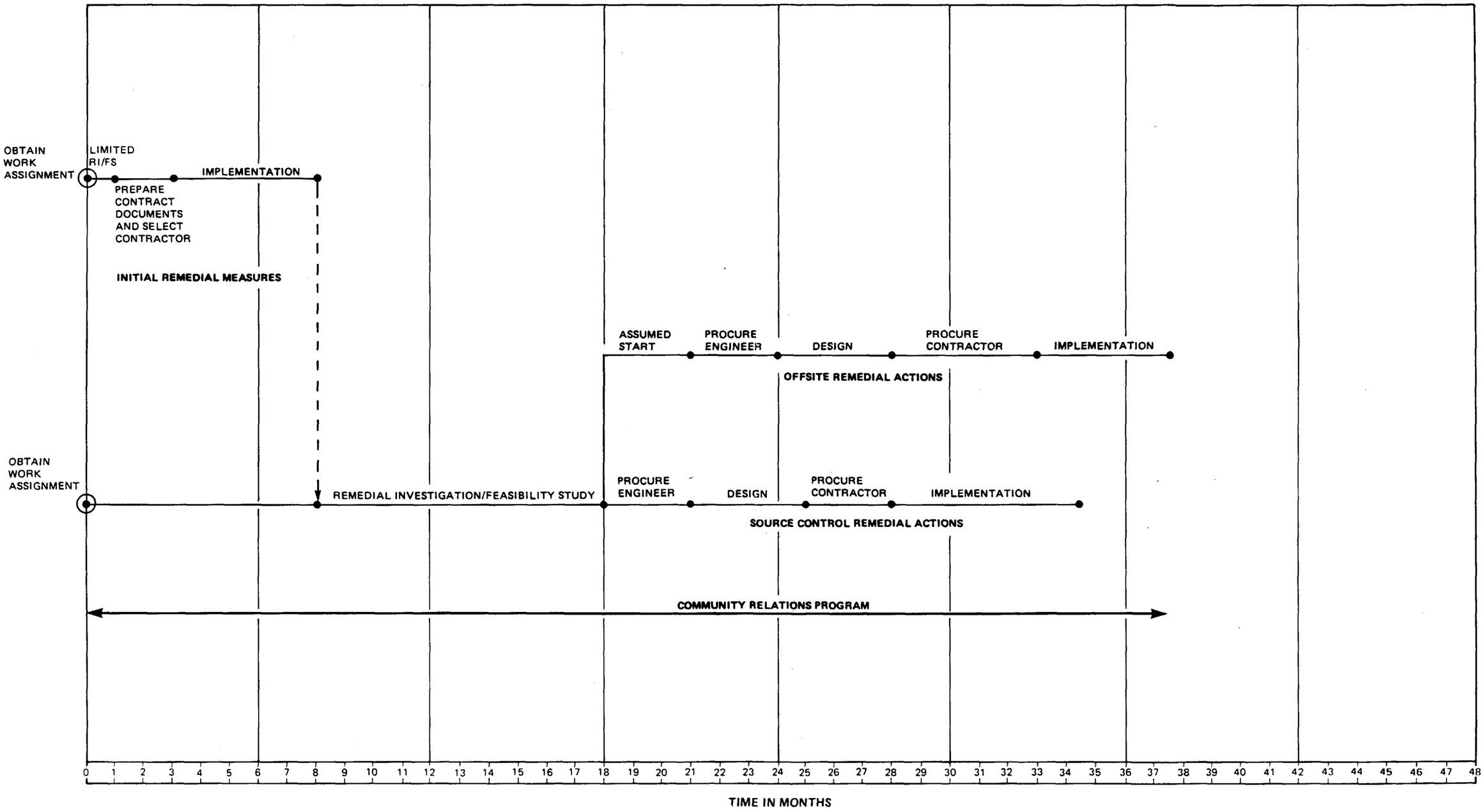
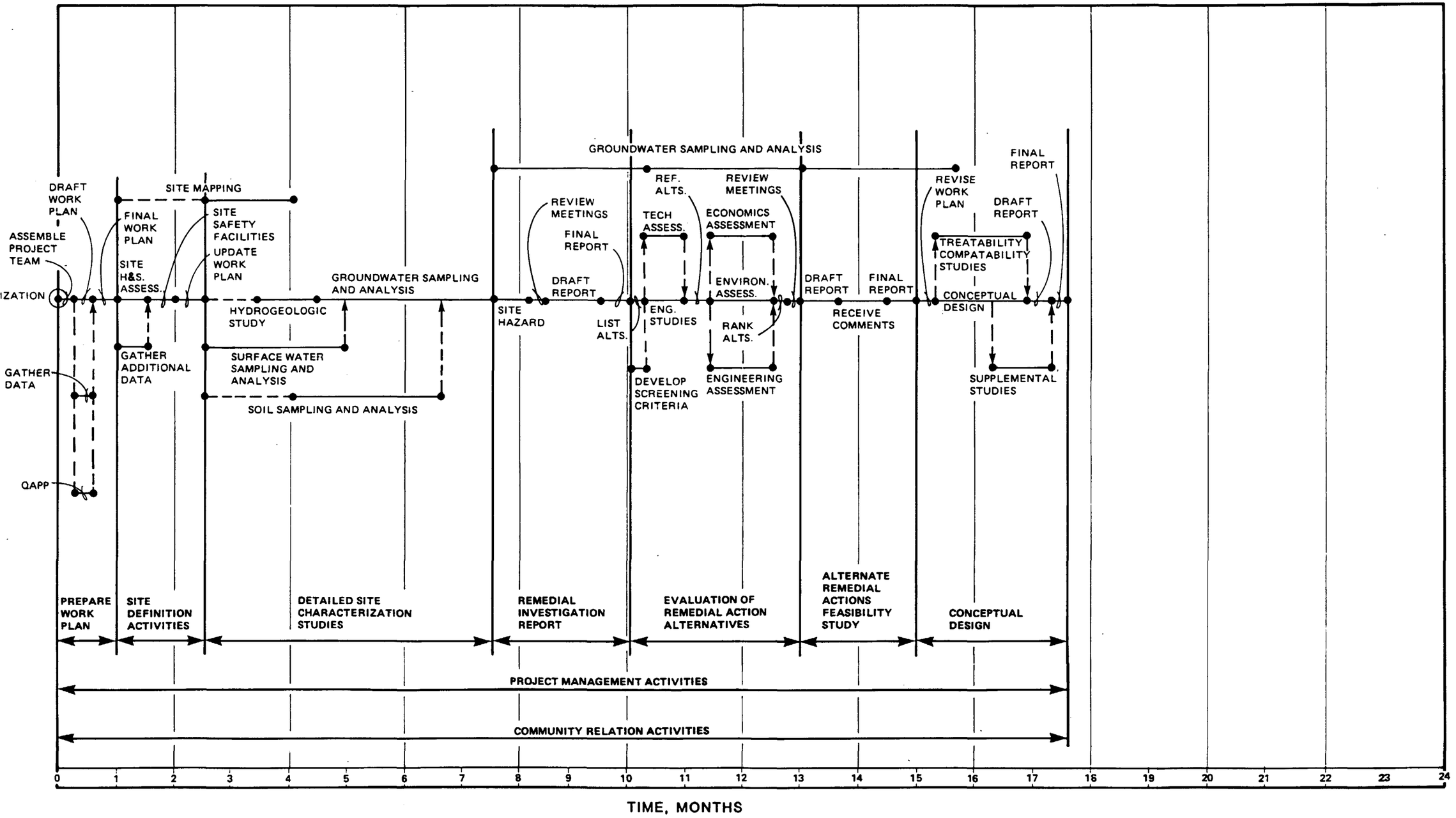


FIGURE 3-1
MASTER SITE SCHEDULE
ECC SITE



– – – – – PREPARATION OF CONTRACT DOCUMENTS AND SUBCONTRACTOR SELECTION

DETAILED SITE CHARACTERIZATION STUDIES

FIGURE 3-2
APPROXIMATE SCHEDULE FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ECC SITE

3.2 INITIAL REMEDIAL MEASURES

3.2.1 Objective

The initial remedial measures (IRM's) discussed in this section are considered feasible and necessary to reduce imminent hazards to public health and the environment from the ECC site. They are consistent with the requirements of Section 300.65 of the National Oil and Hazardous Substances Contingency Plan (NCP). These hazards include the following:

- Potential contamination of local groundwater aquifers and drinking water supplies through the cooling water pond or site discharges to the groundwater.
- Potential contamination of downstream surface water resources and drinking water supplies through cooling water pond overflows or leaks to neighboring surface waters.
- Potential fire or explosion of ignitables, leading to a massive discharge of contaminants to the air and neighboring surface waters.
- Potential contact with acutely toxic substances by nearby residents, workers and animals through air, drinking water, direct contact or food chain pathways.

Cost-effective considerations of the recommended IRM's have been made by minimizing or eliminating the potential hazards listed. Significant visible actions at the site will also have a substantial positive effect on community relations.

All IRM's should be conducted in strict compliance with site health and safety plan requirements. The plan should be developed consistent with the work to be performed and comply with:

- EPA Occupational Health and Safety Manual
- EPA Interim Standard Operating Safety Procedures and other EPA guidance as developed by the EPA
- Indiana Occupational Safety and Health Act
- Site conditions
- Section iii(c)(6) of CERCLA
- EPA Order 1440.1 -- Respiratory Protection
- EPA Order 1440.3 -- Health and Safety Requirements for Employees Engaged in Field Activities

3.2.2 Recommended Actions

The following IRM's are recommended for the ECC site:

- Sampling and analysis of local private wells.

- Construction of a new, secure fence around the site.
- Placement of warning signs around the site.
- Expedient removal of materials stored in bulk tanks.
- Expedient removal of all drums.
- Site surface runoff control.
- Removal of the existing power line.
- Cooling water pond treatment and discharge.
- Preparation and implementation of an onsite fire and explosion contingency plan.

Discussions of each of the IRM's follow.

Sampling and Analysis of Local Private Wells

The contamination of local water supply wells presents a potential hazard to human health by direct contact and ingestion of contaminated groundwater. To determine if such a threat exists, a survey will be conducted to verify the locations of private residential, commercial and industrial wells within a one-half mile radius of the ECC site and to determine the nature and frequency of their use. Sampling and an analysis will be performed to evaluate the immediate need to provide alternative water supplies. These analyses will also provide background data on ambient water quality, both upgradient and downgradient of the site where possible. The monitoring program should continue during site remedial activities and beyond, perhaps at a reduced scale, depending on the results of the initial testing program.

All private well sampling and testing will conform to guidelines contained in the User's Guide to the U.S. EPA Contract Laboratory Program (CLP), prepared by the Sample Management Office of CLP and published August 1982. All groundwater samples are expected to be "low concentration" samples according to CLP criteria.

Groundwater samples will be analyzed for pH (field measured), conductivity (field measured), and the parameters listed in Appendix C.

The groundwater sampling and analysis efforts should be closely coordinated with the Boone County Health Department and any of its ongoing groundwater monitoring work.

To provide an order-of-magnitude cost estimate for this IRM, it was assumed that five groundwater wells will be sampled once and analyzed. Analytical costs were based on recent U.S. EPA CLP costs for priority pollutant analysis.

Fencing

The ECC site now has a 5-foot high wood fence around the south side and a portion of the west side of the area. The

remainder of the west side and the north and east sides are enclosed with a 4-foot high stranded wire fence. The stranded wire fence is in disrepair along some stretches and can be easily stepped over. The wood fence is also in disrepair along the southern site boundary.

During a site visit on January 20, 1983, animal tracks were observed. Apparently these animals have found access through the fencing, and it is possible that contaminants have been carried offsite.

It is recommended that the wood and stranded wire fencing be replaced by a 6-foot chain link fence with three strands of barbed wire. A locked access gate will be provided on the south side of the site.

Warning Signs

Ten additional warning signs will be placed on the fence around the perimeter of the property to provide a clear, visible warning to unauthorized persons. The signs will state "DANGER--UNAUTHORIZED PERSONNEL KEEP OUT" in 3-inch high letters. They will be constructed of galvanized steel with luminescent paint, and will be visible from a distance of 25 feet. Signs should be placed at all gates or access points, and at distances of about 200 feet around the perimeter of the property.

Removal of Bulk Tank Contents

The bulk tanks pose an immediate and continuing hazard to public health and the environment due to the possibility of causing or contributing to explosions and fire onsite. A major fire onsite could be catastrophic due to the generation of toxic fumes and the release of contaminants into Finley Creek. Consequently, the contents of the bulk storage tanks will be removed and disposed of as soon as possible.

It is anticipated that nearly 300,000 gallons are contained in the 47 bulk tanks. The 300,000 gallons will be removed from the ECC site immediately as part of IRM activities. The empty bulk tanks will also be removed as part of IRM activities, but at a later date.

Drum Removal

Drums will be segregated and consolidated into groupings reflective of their compatibility and tentative disposal methods. Existing site inventory data will be used to organize labeled and manifested drums into compatible groupings. Drums of unknown content will be sampled to properly categorize the waste. All drums will be removed from the site as quickly as possible.

Site inspection activities will include documentation of drum removal. Each label will be removed from the drum as it is logged and removed. Each drum will be photographed if identification cannot be removed from the drum. All drum removal procedures will be completely documented so that the source and contents of each drum, and physical evidence of this information is recorded to assist in future enforcement actions.

Site Surface Runoff Control

Site runoff currently collects in ponds in the south and north storage areas or runs off to the cooling water pond. During wet weather, the cooling water pond receives excessive runoff and overflows to the unnamed ditch, a tributary to Finley Creek. The cooling water pond will be maintained as a collection sump for site runoff and miscellaneous discharges during surface cleanup remedial actions. Additional drainage channels will be installed to convey water from ponded areas to the cooling water pond.

Cooling Water Pond Treatment and Discharge

The water collected in the cooling water pond poses a continuing hazard to public health and the environment, especially from potential contamination of groundwater and neighboring surface waters. Both the north and south drum storage area ponds drain into the cooling water pond. Consequently, the water in the pond is contaminated from leaking drums and site spillage.

During periods of heavy rainfall, the volume of water entering the cooling water pond exceeds its storage capacity. Contaminated water then overflows the east dike of the pond, down an embankment into the unnamed ditch.

The volume of the cooling water pond, when full, is about 1,000,000 gallons. It would be uneconomical to remove and transport the contaminated water to an acceptable offsite location for treatment and disposal. It would be more cost-effective to provide onsite treatment for the contaminated water and discharge it to Finley Creek.

A trailer-mounted activated carbon treatment system will be located onsite to treat the contents of the cooling water pond. An initial bioassay study will be conducted on the treatment plant effluent following startup. A continuous biomonitoring program will be implemented and conducted for the period of operation of the treatment system. The treated water will then be discharged to Finley Creek.

To minimize the overflowing of cooling water pond contaminated contents in the spring, the treatment system will be

brought onsite and placed in operation. By treating as much of the cooling water pond contents as possible before spring wet weather, the surge or available storage capacity of the pond can be increased. This procedure will mitigate any significant discharges of contaminated water to the unnamed ditch during wet weather or spring runoff.

The treatment system can also be used during the implementation of remedial actions to treat any surface runoff that enters the pond from the drum storage areas or groundwater. Once the surface cleanup activities have been completed, the pond contents can be pumped out for treatment. Final closure of the site, the pond sediments, site contaminated soils and other items are discussed under offsite remedial actions.

Fire Contingency Plan

An onsite fire could have significant consequences to area residents and to local surface water resources. Due to the many flammable substances packed in the relatively small area onsite, a fire will engulf the site rapidly. Air contaminants will be generated and migrate offsite to the surrounding area. Fire fighting water and the contents of ruptured drums and bulk tanks will flow from the site to the unnamed ditch and downstream.

Upon detection of an onsite fire, the following immediate responses will be required:

- Notification of local fire and police departments and the ISBH.
- Evacuation of nearby residents.
- Protection of local surface water resources.

The contingency plan will include notification procedures and chain of command for each of the above tasks. Local fire, police, and health departments will be contacted during preparation of the plan for their review and comments. Of particular importance will be the protection of the local surface water resources. The plan will identify necessary steps to protect these resources. It will include containment of discharges to Finley Creek with a temporary dam, and rapid turnaround test results of water samples from Eagle or Finley Creeks.

3.2.3 Cost Estimates and Time Schedule

The order-of-magnitude cost estimates and schedule for each of the IRM's are shown in Table 3-1.

Table 3-1
IRM COSTS AND TIME SCHEDULE
ECC SITE

Initial Remedial Measures	Estimated Cost Low($)	Estimated Cost High($)	Schedule of Weeks 2	4	6	8	10	12	14	16	18	20	22	24
Sampling and Analysis of Private Wells	6,900	14,700	----------											
Construct New Fence	13,200	28,300	- - - - - -			----------								
Provide Warning Signs	600	1,200				--------								
Removal of Bulk Tank Contents	181,000	388,000	- - - - - -			----------								
Drum Removal	2,420,000	5,186,000	----------											
Site Surface Runoff Control	4,000	8,600	-----											
Power Line Removal	13,000	18,000	----------											
Cooling Water Pond Treatment and Discharge	250,000	500,000	----------											
Fire Contingency Plan	2,400	5,100	-----											
TOTAL	$2,891,100	$6,149,900												

GLT90/10-2

3.3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

3.3.1 Objective

The objectives of the remedial investigation/feasibility study (RI/FS) recommended for the ECC site include:

- Characterize the soil and groundwater contamination at the site.
- Characterize the soil and groundwater contamination that may have migrated from the site.
- Identify specific contaminants posing acute hazards to public health.
- Identify pathways of contaminant migration from the site.
- Determine and describe onsite physical features that could affect migration of contaminants, methods of containment, or methods of remedial action cleanup.
- Develop viable remedial action alternatives.
- Permit the evaluation of the remedial action alternatives.
- Recommend the most cost-effective remedial action alternative for the site.
- Prepare conceptual design of the recommended remedial action alternative.

The available data and information on the ECC site are insufficient to allow a definitive selection, screening, and feasibility study of remedial action alternatives without additional work.

3.3.2 Scope of Work

The scope of work proposed for the RI/FS follows. It includes eight activities, each having several defined tasks which are:

- Preparation of work plan
- Site definition activities
- Detailed site characterization studies
- Remedial investigation report
- Evaluation of remedial action alternatives
- Alternative remedial action feasibility report
- Conceptual design
- Project management activities

Activity 1 - Preparation of Work Plan

This activity will refine the scope of work for the RI/FS discussed in this RAMP. It will develop a schedule and work plan to implement the recommended RI/FS activities.

The goals for this activity are:

- Assemble project team
- Hold a kickoff meeting
- Gather available background data
- Prepare quality assurance plan
- Prepare site health and safety plan
- Perform site visit
- Prepare and submit draft work plan and final work plan

Task 1-1 - Assemble Project Team. Upon receipt of the work authorization, a project team will be assembled. A kickoff meeting will be held between the RSPO and other agency personnel and appropriate members of the project team. The objectives of this meeting are:

- Introduce respective team members
- Discuss the overall project objectives and approach
- Obtain relevant data
- Discuss sensitive issues
- Establish channels of communications and reporting

Task 1-2 - Prepare Quality Assurance Plan. A site-specific quality assurance (QA) project plan will be developed that incorporates, by reference, the appropriate portions of the general QA project plan. The plan will include any other needs specific to the work assignment or requested by EPA as a result of extraordinary project requirements. A copy of the QA plan will be provided to appropriate EPA and State project personnel.

Task 1-3 - Work Plan. Based on the information obtained in Tasks 1-1 through 1-3, a draft work plan will be prepared and submitted for Agency review no later than 15 days following receipt of the work assignment. The final work plan will be submitted 7 days after receipt of written agency comments on the draft plan.

Activity 2 - Site Definition Activities

This activity will define the physical characteristics of the site and establish onsite health and safety facilities for use by all field personnel.

The following tasks are recommended for the ECC site:

- o Gather additional data
- o Establish site safety facilities
- o Prepare a site health and safety assessment
- o Conduct site mapping program
- o Update work plan

Each task is described below in detail and follows.

Task 2-1 - Additional Data Gathering. A detailed data search will be performed to compile available site information. Additional maps, historical photographs, and geologic, soils, surface water, and groundwater data and reports (both published and unpublished) will be collected. Some sources of additional data include: USGS, Soil Conservation Service (SCS), State Geological Survey (or equivalent), NOAA, local health department, stream gauging records, U.S. Weather Bureau records, and local well drillers.

Other data will be collected from sources such as site records, review of manufacturing processes for industries using the site, interviews with cooperative personnel (site owners and operators, nearby residents, and industrial employers formerly using the site, subject to EPA approval), newspaper reports, shipping manifests, etc. Information obtained in this data gathering effort may generate information regarding the sources of materials stored on the site, and may be of interest to EPA's Enforcement Group.

Available information on sampling and testing will be compiled and summarized. Sources of data include, but are not limited to: U.S. EPA, Indiana State Board of Health, Purdue University, Boone County Health Department, and Environment and Ecology, Inc. The summary will include location of samples, evaluation of test results, date testing was performed, sampling and testing procedures used and the agency that performed the testing.

To provide an order-of-magnitude cost estimate, it was assumed that one trip to Indianapolis will be required for meetings.

Task 2-2 - Site Safety Facilities. This task identifies and provides site safety and decontamination facilities for the RI/FS activities.

A combination decontamination and office trailer will be supplied for site use by all field personnel, as required and identified in the health and safety plan. The facility will be supplied by a contractor on a rental basis or purchased, whichever is most cost-effective. Detailed specifications will be developed for space requirements, decontami-

nation equipment, furnishings, and utilities (power, water, waste). The facility will include a secure waste material storage area for temporary storage of wastes generated during onsite work.

The cost estimate assumes that level C protection is required for most onsite tasks and that a trailer is needed for the duration of field activities.

Task 2-3 - Prepare Site Health and Safety Assessment

The objective of a health and safety site assessment is to determine if there are portions of the site that present either potentially hazardous chemical exposure levels in the air or dangerous physical features. Such information will be useful in selecting and implementing remedial actions that provide local residents and remedial action investigators/workers with adequate warnings and safeguards. Before conducting the onsite assessment, available information on the site will be examined and reviewed to identify possible sources of hazardous air emissions and potentially hazardous areas.

Trained technicians will conduct a thorough inspection of the entire site. They will use the appropriate monitoring equipment such as colorimetric chemical indicator (Draiger) tubes, combustible gas indicator, organic vapor analyzer and photoionization detector. This equipment will be used to obtain sufficient data to render an evaluation of the potential for adverse health effects from chemical exposure levels in the area.

The site health and safety plan prepared for the RAMP initial site visit will be revised and updated for RI/FS onsite activities, based on the information collected to date. The plan will specify the field tests to be performed and the protective gear to be worn by site visitors. It will focus on the use of personal protective equipment to minimize exposure to hazardous materials through inhalation or direct contact.

If significant IRM's are implemented onsite before the commencement of RI/FS activities, the IRM site health and safety plan will be revised to allow for the changed site conditions. A copy of the site health and safety plan will be provided to appropriate EPA and State project personnel.

To provide an order-of-magnitude cost estimate, it was assumed that one trip to the site will be necessary for this task.

Task 2-4 - Site Mapping. A topographic survey is recommended at the ECC site to create a site plan showing elevations and locations of all pertinent physical features.

A legal description of the property will be researched in Boone County records and those of Northside Sanitary Landfill, and verified in the field. The intent is not to perform a property boundary survey, but to confirm boundaries so that subsequent remedial investigations and remedial measures will not carry over into neighboring properties without appropriate permission.

The topographic survey of the site will determine horizontal distances and vertical relief physical features relative to the property boundary and vertical elevations relative to National Geodetic Vertical Datum of 1929 (NGVD).

Typical onsite features/facilities will include, but not be limited to:

- Fences
- Office and process buildings
- Dikes
- Breaks in grade
- Site drainage ditches

Typical offsite features/facilities will include, but not be limited to:

- Elevations and locations of U.S. 421 and landfill access roads adjoining the site.
- Cross sectional elevations of the unnamed ditch to the east and the drainage ditch to the west and south of the site at regular intervals.
- Elevations of existing groundwater monitoring wells.

A topographic map will be produced showing 1-foot contours with a scale of 1 inch = 50 feet. The maximum allowable horizontal error for any given point for a topographic map of this scale is 0.5 feet, and the maximum allowable accuracy of any individual elevation is 0.1 feet.

To provide an order-of-magnitude cost estimate for this task, it was assumed that the site is classified as Level C for health and safety and that aerial photography would be used to develop the topographic map. The cost estimates assume a survey of 15 acres. It was also assumed that one trip would be required to the site.

An infrared aerial photograph will be taken at the time of the aerial mapping. This photograph will be used to assess the extent of stressed vegetation near the site as part of Task 2-1.

Task 2-5 - Work Plan Update and Report. Based on the data collected in Tasks 2-1 through 2-4, the work plan prepared in Task 1-4 will be reviewed and revised as needed to update the preliminary scope of work for the following section, detailed site characterization studies.

A summary report will be prepared at the conclusion of the Site Definition Activities. Included will be the results of Task 2-1 through 2-4 and the work plan update. A copy will be provided to appropriate EPA and State project personnel.

Activity 3 - Detailed Site Characterization Studies

Currently available data and information on the ECC site is insufficient to allow the selection, screening, and feasibility study of remedial action alternatives. The following sections constitute a work plan for remedial investigations to obtain detailed site data to meet the above objectives for the ECC site.

Proposed remedial investigations under this activity include:

- Hydrogeologic study
- Groundwater sampling and analysis
- Surface water sampling and analysis
- Soils sampling and analysis

Task 3-1 - Hydrogeologic Study. A hydrogeologic study will be performed to evaluate the subsurface geology, water-bearing formations and groundwater flow. This information is required to determine:

- The horizontal and vertical extent of any contaminant plume that may be present.
- The ability of the site and local geology to prevent pollutant migration.
- Groundwater and aquifer characteristics pertinent to design and implementation of remedial actions.

Available groundwater information including well data will be reviewed by a geologist before initiating field work. Sources of additional data include the USGS, State Geological Survey, local well drillers, and other nearby sites.

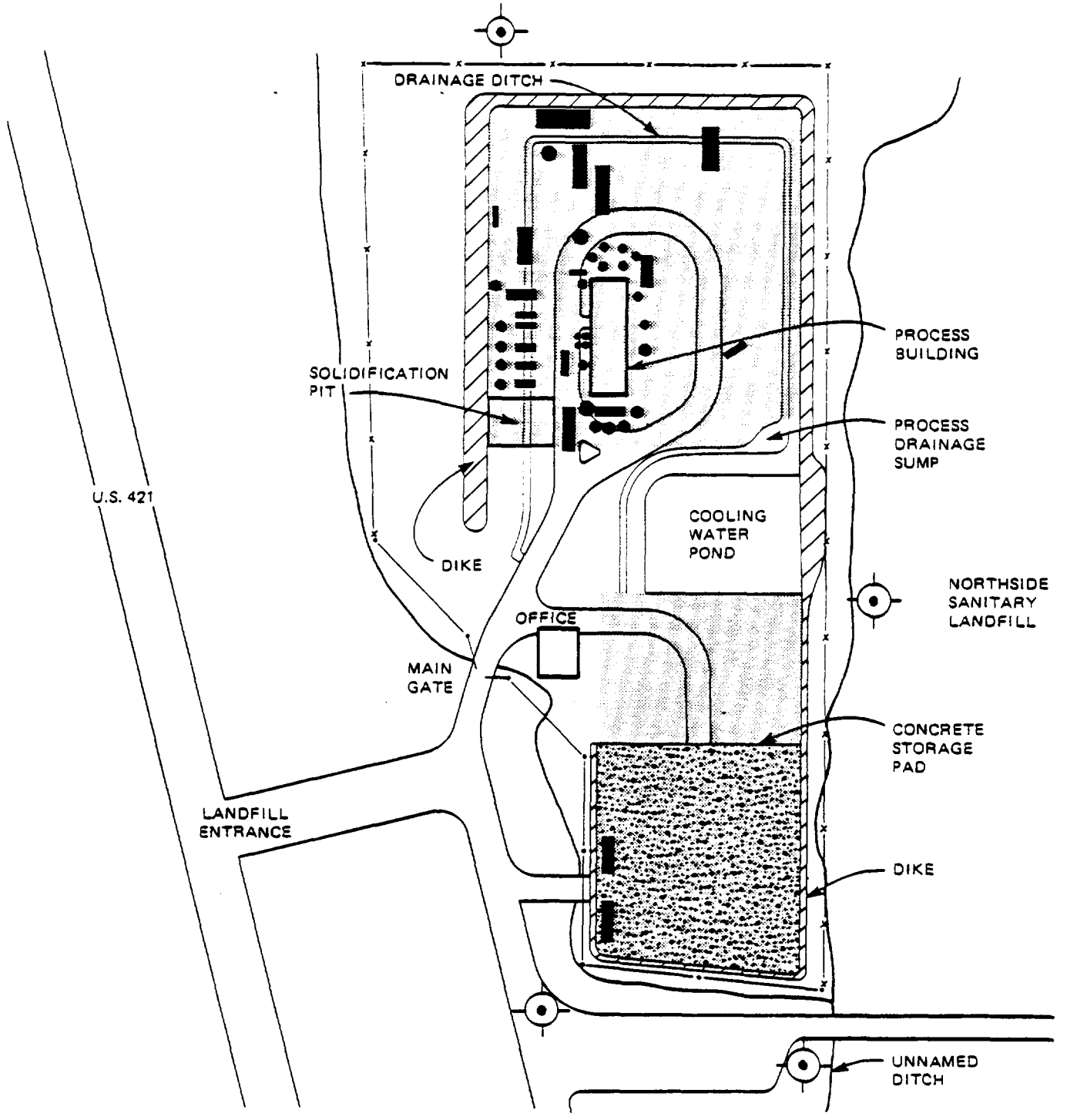
A geologist will visit the site to evaluate surface features, identify locations of existing wells, and lay out the electrical resistivity survey and new monitoring well locations.

An electrical resistivity survey will be performed to assist in the evaluation of subsurface stratigraphy, depth to groundwater and the presence and lateral extent of groundwater contamination. The results of the survey must be correlated with information obtained from the monitoring wells.

Four resistivity survey lines are proposed: two parallel to the anticipated direction of groundwater flow; one north and one south of the site; another perpendicular to the flow direction, south of the site; and a fourth parallel to the east boundary of the site, along the ditch. The lines will extend beyond the site where possible to investigate adjacent area sources, especially the landfill. Lines will also pass close to some monitoring wells to permit correlation with drilling log data.

Groundwater monitoring wells will be installed in four locations (see Figure 3-3) in clusters of three to monitor the upper aquifer, the bottom of the upper aquifer (or middle aquifer), and the top of the lower aquifer at bedrock. Groundwater monitoring wells will be constructed to comply with applicable Federal, State, and local agency regulations. All well drilling and installation will be logged and inspected by a qualified geologist. Tentative procedures are:

- All drilling equipment, pipe, and materials will be decontaminated before drilling.
- Exploratory holes will be rotary drilled with clean water and a minimum 4-inch diameter steel temporary casing.
- Soil samples will be collected in the deep hole of each monitoring well cluster, using a standard split-spoon sampler (ASTM D1586), continuously down to the water table and at 5-foot intervals, or at changes in strata below the water table.
- The middle and shallow wells in each cluster will be constructed with 2-inch-diameter stainless steel or threaded coupling PVC well screen and black iron standpipes. The deep well in each cluster will be constructed with a 4-inch diameter stainless steel or PVC well screen and a black iron standpipe. Sensing zones will be gravel packed and capped with sand and sealed with bentonite. Above the bentonite, the entire well annulus will be sealed with a sand, cement, and bentonite grout



LEGEND

- DRUM STORAGE AREA
- TANKS
- WOOD FENCE
- STRANDED WIRE FENCE
- CONCRETE PAD
- PROPOSED MONITORING WELL CLUSTER LOCATIONS

N

0 250

125

SCALE IN FEET

FIGURE 3-3
MONITORING WELL LOCATIONS
ECC SITE

mixture as the temporary casing is withdrawn. Special care must be taken in grouting wells to prevent bypass of contaminated waters along the annulus. A concrete surface pad will be installed to support the standpipe and to prevent runoff from entering the well hole.

- o A protective, vented, locking cap will be installed.
- o Wells will be properly developed after installation. When sampling, a minimum of 5 to 10 well volumes must be pumped and the well allowed to recover before samples are taken.
- o All drilling equipment, pipe, and materials will be decontaminated before proceeding to next hole.
- o Top of casing and ground surface elevations will be obtained for all wells.
- o Use of bentonitic-base drilling muds should be avoided to prevent clogging of the formations. All wells should be fully developed by surging and/or other methods.

All drilling water must be contained and disposed of in an acceptable manner. Representative soil samples will be tested in the laboratory to aid in soil classification (see Task 3-4).

A hydrogeologic report of the site will be prepared to provide documentation of data obtained during drilling and installing wells. This report will include hydrogeologic profiles, aquifer conditions, laboratory test results, boring plot plan and logs, and conclusions.

To provide an order-of-magnitude cost estimate, the following assumptions were made:

- o 4,000 lineal feet of resistivity survey lines.
- o 1,040 lineal feet of soil drilling, casing, and installing of wells.
- o 20 samples will be analyzed for soil classification.
- o Three trips to the site will be required during the drilling and well installation program.

Task 3-2 - Groundwater Sampling and Analysis. Following installation, development and stabilization of the monitoring wells, a groundwater sampling and analysis program will be conducted. The objective of the program is to provide

groundwater quality data that will help define the location, both vertically and horizontally, of any contaminant plume found in the groundwater.

Groundwater samples will be collected from all monitoring wells and analyzed for pH (field measured), specific conductance (field measured), oil and grease, total solids and the parameters listed in Appendix C.

All sampling and testing will conform to guidelines in the User's Guide to the U.S. EPA Contract Laboratory Program (CLP), prepared by the Sample Management Office of CLP and published August 1982. All samples are expected to be "low concentration" samples according to the CLP criteria.

A report summarizing the sampling and analysis program will be prepared to present the test results and to evaluate the extent of contamination.

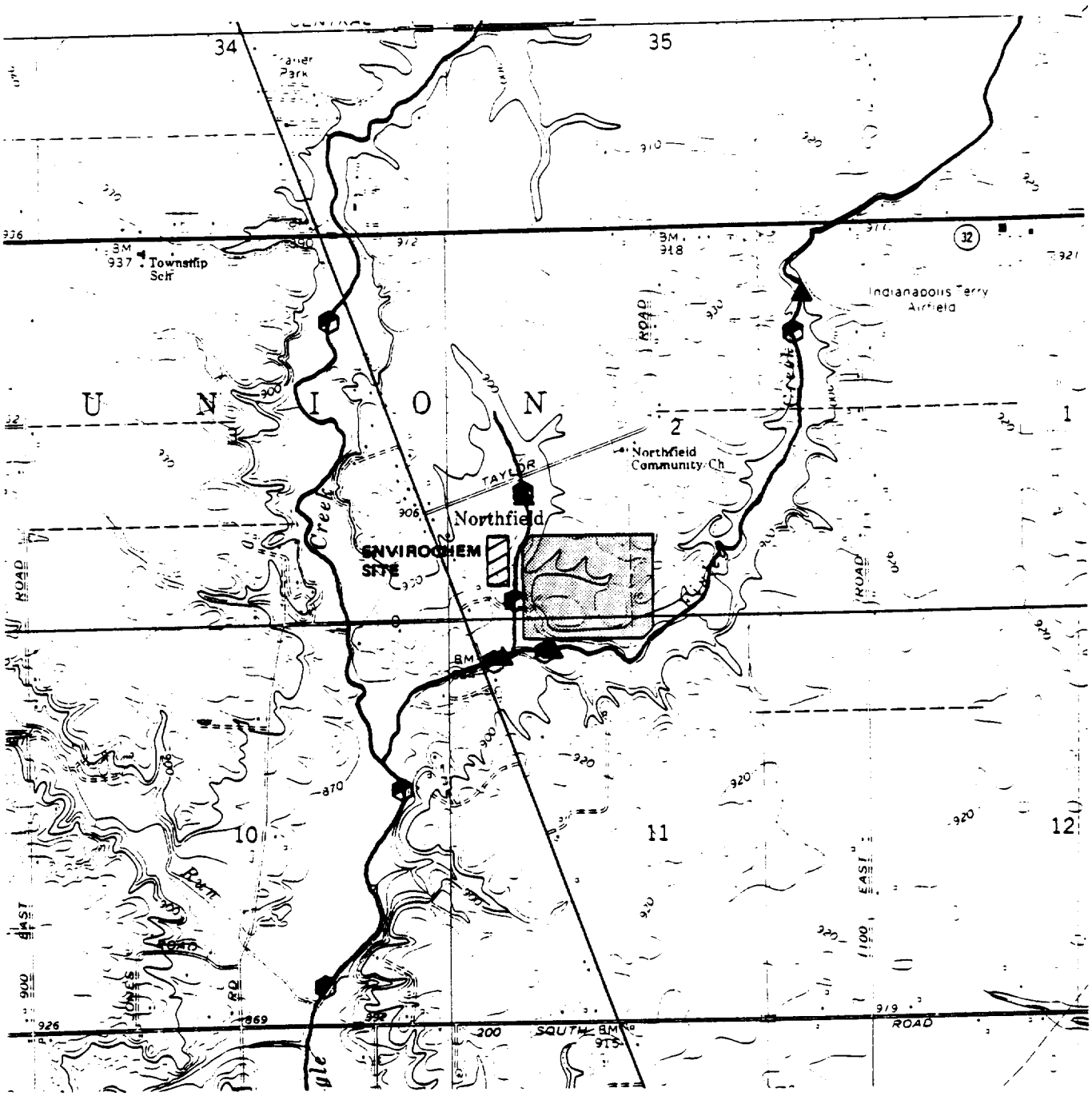
To provide an order-of-magnitude cost estimate for this task, it was assumed that groundwater samples will be obtained from each of the 12 wells four times per year and analyzed. Four blank samples and four duplicate samples will be included with the 48 groundwater samples. The existing monitoring well No. 1 will also be sampled during the first sampling event. Analytical costs were based on recent U.S. EPA CLP costs for organic and inorganic analysis.

Task 3-3 - Surface Water and Sediment Sampling and Analysis. This task will determine the extent of contamination in the unnamed ditch east of the site, Finley Creek and Eagle Creek. Previous sampling efforts have indicated possible contamination of the water and sediments offsite. Data obtained in this task will be used in determining if offsite remedial measures are required.

Six sampling locations are indicated in Figure 3-4. At four locations, the surface water and sediments will be sampled. Only sediment samples will be collected at the other two sampling locations.

All samples will be analyzed for pH (field measured), specific conductance (field measured), oil and grease and the appropriate parameters listed in Appendix C. EP toxicity tests will be conducted on selected sediment samples.

All sampling and testing will conform to guidelines in the User's Guide to the U.S. EPA Contract Laboratory Program (CLP), prepared by the Sample Management Office of CLP and published August 1982. All samples will be low concentration samples according to the CLP criteria.



LEGEND

NORTHSIDE LANDFILL

POSSIBLE SAMPLING LOCATIONS

N

0 4000

2000

SCALE IN FEET

FIGURE 3-4
POSSIBLE SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
ECC SITE

If significant contamination exists, additional sampling may be necessary. Cost estimates do not include any additional sampling.

A report discussing surface water contamination will be prepared that includes an evaluation of the presence and possible impact of surface water contamination.

The cost estimate assumes four surface water samples, six sediment samples, one duplicate sample and one blank sample will be tested. No travel expenses are included in the cost estimates since this task can be undertaken during other tasks.

Task 3-4 - Soils Sampling Analysis. The objective of sampling and analyzing the surface soils is to collect data on the depth, areal extent, and concentration of hazardous constituents at potential source areas on the site. Infiltration rates of the near-surface soils and the degree of offsite migration of contamination will be determined. Before any soil samples are collected, the site physical features will be examined and the scope of work refined to set actual sample locations.

Representative split spoon samples will be collected from soil borings taken from a grid system established for the site. Special areas requiring investigation will be the solidification pit area and the site berms. The samples will be taken continuously to a depth of 4 feet or to the groundwater table, whichever is encountered first. Each sample will be packaged and stored for analysis.

The uppermost sample from each location will be analyzed for the parameters listed in Appendix C. The test results will be required to evaluate offsite disposal of contaminated soils at a landfill. Samples taken at depths below 6 inches will be analyzed only if significant concentrations of contaminants are detected in the preceding (overlying) sample. Levels of "significance" will be set by an appropriate regulatory agency.

An additional phase of sampling and analysis may become advisable to more closely define the areal extent or the vertical extent of contamination in the general site area. The appropriate amount of additional work cannot be predicted at this time.

All sampling and testing will conform to guidelines in the User's Guide to the U.S. EPA Contract Laboratory Program (CLP), prepared by the Sample Management Office of CLP and published August 1982. All samples will be low or medium concentration samples according to the CLP criteria.

Field permeability tests will be conducted to determine the infiltration rates of the near-surface soils. These infiltration rates may be used to approximate the onsite near-surface vertical recharge or to evaluate the effectiveness of placing an impermeable cover system over the site. Six infiltration tests will be run at representative locations across the site, three contaminated and three noncontaminated areas, using a single-ring infiltrometer or similar device.

The cost estimate assumes 40 soil samples will be analyzed. EP toxicity tests are assumed to be needed on half of these samples.

A report of the soil sampling program will be written to present the test results, and to delineate the areal extent and depth of soil contamination.

Activity 4 - Remedial Investigation Report

Data collected during the remedial investigation phase will be evaluated to determine the conditions at the site present a hazard to human health or welfare, or to the environment.

The following tasks are recommended for ECC:

- o Assess site hazards
- o Conduct review meetings
- o Prepare remedial investigation report

Task 4-1 - Assess Site Hazards. Data collected during the remedial investigation phase will be evaluated to determine if the materials at the site present a hazard to human health or welfare, or to the environment.

Existing standards will be reviewed to formulate conclusions and recommendations regarding the hazard potential of the ECC site.

A report will be prepared summarizing the hazard evaluation process and presenting the results of the hazard assessment. A copy will be provided to appropriate EPA and State project personnel.

Task 4-2 - Conduct Review Meeting. Following a review of the report, a review meeting will be held with EPA and other appropriate agency personnel to determine remedial action objectives, identify alternative level operable units and associated remedial actions to be addressed in the feasibility study and to discuss the contents of the remedial investigation report. A list of potential operable units and remedial actions will be prepared by the project team before the meeting to provide a basis for the discussion. A list of current potential operable units for ECC follows:

Remedial Action Category	Operable Unit Category
Initial Remedial Measures	Could include any of the units identified below
Source Control Remedial Actions	Contaminated soil Contaminated surface runoff Contaminated groundwater
Offsite Remedial Actions	Contaminated groundwater Contaminated surface water Contaminated soil/sediment Domestic water supplies

To determine the viability of the various alternatives, the following factors will be qualitatively evaluated as they relate to the project objectives:

- The ability to control onsite release or to mitigate offsite impacts (high, medium, low).
- The adverse environmental impacts of each alternative (high, medium, low).
- The feasibility, applicability, and reliability of remedial action method for location and conditions of release (yes, no, potential).
- A preliminary cost estimate indicator (high, low, medium) for both capital and operation and maintenance costs.

On the basis of the review meeting, an agreement will be reached on the remedial action alternatives to be used in the feasibility study. A public community relations workshop or community involvement meeting will be held shortly after this time to receive public input into the remedial action alternative selection process.

Task 4-3 - Prepare Remedial Investigation Report. A draft remedial investigation report will be prepared to consolidate and summarize the data collected during the remedial investigation. The report will include a discussion of the operable units and remedial actions considered, recommendations regarding whether or not to proceed with the feasibility study, and the recommended remedial action alternatives that should be included in the feasibility study. The draft report will be submitted to EPA for review within 15 working days following the review meeting.

EPA's written review comments will be incorporated into the final report, which will be submitted to EPA for approval

within 10 working days following receipt of the written comments.

Activity 5 - Evaluation of Remedial Action Alternatives

This activity will evaluate the alternative remedial actions on the basis of economic, environmental, and engineering criteria, and will select an alternative or combination of alternatives for conceptual design and implementation. The level of detail developed under this activity will only identify comparative or relative differences among alternatives.

The following tasks are recommended for ECC:

- Develop listing of potential alternatives
- Develop screening criteria
- Additional engineering studies
- Technology assessment
- Refine alternatives
- Economic assessment
- Environmental assessment
- Engineering assessment
- Comparative ranking of alternatives
- Comparative ranking review meeting

Task 5-1 - Development of Potential Remedial Alternatives. Based on the work completed in the remedial investigations, a list of potential remedial actions will be developed. The no action alternative will be included in the evaluation as a baseline alternative. It may be a viable alternative if potential remedial actions present a greater danger than the identified hazard itself, if an appropriate engineering solution is not available, or if cost-effectiveness dictates.

Task 5-2 - Develop Screening Criteria. Screening criteria will be prepared to assess the remedial action alternatives. The factors addressed in developing the screening criteria include:

- Economic. The capital and long-term operational and maintenance (O&M) costs are estimated and a present worth value determined for cost comparison of alternatives.

- Environmental Effects. The adverse impacts of the alternatives, the adequacy of source control, and the acceptable mitigation of danger to public health and welfare and the environment will be identified. Included in the criteria will be public acceptability, institutional issues (e.g., implementation capability), and legal issues (e.g., ability to obtain a permit).

- o Engineering. The alternative must be technically feasible regarding site location and conditions. It must be applicable to the project needs, and must be a reliable method of solving the problem.

The identified remedial action alternatives will be screened according to these criteria, and a report will be prepared summarizing the screening process.

Task 5-3 - Additional Engineering Studies. After screening the remedial action alternatives for further evaluation, the project team will evaluate the field investigation studies completed during the remedial investigation. They will identify any additional engineering studies that are required to fully evaluate the cost, the constructibility, applicability, or reliability of any alternative. It has been assumed no additional engineering studies will be required.

Task 5-4 - Technology Assessment. Since treatment or disposal of soils, sediments, groundwater, or surface water is a potential remedial action alternative at the ECC site, a technical assessment of treatment options will be conducted.

A report will be prepared documenting the results of a literature search and technology assessment, and present the conclusions regarding the applicability of various technologies. One or more technologies may be identified for further evaluation.

Task 5-5 - Refine Alternatives. Based on all the available data, the remaining alternative remedial actions will be refined and more fully developed. A detailed written description of each alternative, basic component diagrams for each alternative to be considered, major equipment needs and utility requirements, conceptual site layout drawings, and preliminary implementation schedule will be made. A report will be prepared presenting this information.

Task 5-6 - Economic Assessment. Construction and O&M costs will be estimated for each remedial action alternative. The comparative cost impacts of health and safety requirements on construction and continuing O&M will be included in the cost estimates. The cost estimates prepared for this task will be order-of-magnitude. This type of estimate is defined by the American Association of Cost Engineers as follows.

Order-of-Magnitude Estimate. An approximate estimate made without detailed engineering data. Examples include: an estimate from cost-capacity curves, an estimate using scale-up or scale-down factors, and an approximate ratio estimate. It is expected that an estimate of this type will be accurate within +50 percent and -30 percent.

After completion of the cost estimate, a present-worth analysis will be conducted. A report will then be prepared summarizing the findings and presenting the results of the cost estimates.

Task 5-7 - Environmental Effects. The alternatives will be evaluated based on the environmental screening criteria developed. The comparative assessment will determine:

- The adverse environmental impacts of the alternatives.
- The effectiveness of adverse impact mitigation measures.
- The adequacy of source control measures.
- The effectiveness of offsite control measures.
- The public acceptability of the alternative.
- The institutional and legal (environmental permits) constraints.

A report will be prepared summarizing the findings and presenting the results of this assessment.

Task 5-8 - Engineering Assessment. The engineering aspects of the alternatives will be assessed on the basis of acceptable engineering practices. The specific factors to be evaluated include:

- Reliability
- Established technology
- Suitability to control the problem
- Risks to construction and operational personnel health and safety
- Constructibility and operability regarding site conditions
- Maintainability and sensitivity to offsite upset
- Offsite transportation and disposal capacity requirements

A report will be prepared summarizing the results.

Task 5-9 - Comparative Ranking of Alternatives. During this task, the assessments will be compiled, the alternatives ranked within each assessment category, and overall rankings prepared. This ranking will be based on professional judgment and will reflect EPA, State, local and public input. A report will be prepared summarizing the comparative rankings.

Task 5-10 - Comparative Ranking Review Meetings. Review meetings will be held to solicit input into the comparative ranking of the remedial action alternatives. The review meetings should include both U.S. EPA and State personnel.

A community relations meeting will be held focusing on a clear description of the problem, advantages and disadvantages of each alternative and its relative ranking. A spokesperson will be present to answer technical questions.

A report will be prepared summarizing the review process and the comments received.

Activity 6 - Alternative Remedial Actions Feasibility Report.

A draft report will be prepared summarizing data developed during the evaluation of alternatives and documenting the alternative remedial actions assessment process. On the basis of the entire evaluation process, one alternative or a combination of alternatives may be recommended for consideration in the conceptual design. This draft report will be submitted to EPA for review.

Following receipt of review comments and approval of the recommended remedial actions the Alternative Remedial Actions Feasibility Study Final Report will be submitted. The final report incorporates the review comments and documents the State and EPA decision process.

Activity 7 - Conceptual Design

The conceptual design activity will be the mechanism by which the selected remedial alternative(s) are defined for the Army Corps of Engineers. The following scope of work addresses the conceptual design requirements, provides additional data that will be needed to prepare a design consistent with the objectives of the proposed remedial actions, and is intended to allow preparation of an order-of-magnitude level cost estimate. It is recommended that the Corps be included in the reviews of work plans and work products during conceptual design activities.

Task 7-1 - Preparation of Conceptual Design Elements

The following conceptual design elements will be developed as required for the remedial actions selected.

- A conceptual plan view drawing of the overall site, showing general locations for project actions and facilities.
- Conceptual layouts (plan and cross sectional views where required) for the individual facilities, other items to be installed, or actions to be implemented.
- Conceptual design criteria and rationale.

- A description of types of equipment required, including approximate capacity, size and materials of construction.
- Process flow sheets, including chemical consumption estimates and a description of the process.
- An operational description of process units or other facilities.
- A description of unique structural concepts for facilities.
- A description of operation and maintenance requirements.
- A discussion of potential construction problems.
- Right-of-way requirements.
- A description of technical requirements for environmental mitigation measures.
- A listing of additional engineering data required to proceed with design.
- Construction permit requirements.
- Order-of-magnitude implementation cost estimate.
- Order-of-magnitude annual O&M cost estimates and duration of operating expenses.
- Preliminary project schedule.

Task 7-2 - Supplementary Activities

To supplement the conceptual design and to assist the Corps in the design and implementation of the recommended remedial action, additional work may be required. Examples of some additional activities are:

- Outline a site-specific remedial action, and a specific health and safety plan.
- Review the community relations and environmental impacts of the remedial actions.
- Prepare budget level cost estimates.
- Prepare a project schedule.
- Refine environmental permit and institutional requirements.

A level of effort equal to 50 percent of Task 7-2 has been assumed for cost estimating purposes.

Task 7-3 - Preparation of Draft Report

A draft report summarizing conceptual design data and information will be prepared and five copies will be submitted to EPA for review.

Task 7-4 - Draft Report Review

A draft report review meeting will be scheduled within 5 days of the submittal of the draft report. EPA review comments will be discussed at this meeting.

Task 7-5 - Preparation of Final Conceptual Design Report

Within 10 days of the receipt of written EPA review comments, the draft report will be finalized and five copies submitted to EPA.

Activity 8 - Project Management

The Zone II REM/FIT contract is designed to investigate and develop solutions for hazardous waste sites involving people from Federal, State, and local agencies, and various private concerns. The program includes intensive reporting requirements and, because of potential litigation at the sites, rigorous documentation requirements.

To ensure the cost-effective compliance of RI/FS activities with various applicable policies and procedures, project management efforts play a key role in the successful completion of an assignment. Some of the responsibilities of the site project manager (RSPM) are:

- Working with the EPA RSPO to plan the work assignment, including scope definition, budgeting, and scheduling.
- Preparing the work plan.
- Keeping EPA's RSPO fully informed of project activities.
- Staffing the work assignment including staff selection, coordination, and scheduling.
- Budget and schedule control.
- Communication with external, EPA and State personnel project participants.
- Maintenance of project quality.

- Assisting in preparation of monthly Regional Work Plans.
- Subcontractor monitoring.
- Achieving small business, economically disadvantaged business and labor surplus area subcontracting goals.
- Technical, management, and financial information transfer to the ZPMO.
- Preparing monthly progress reports, activity completion report and technical and financial status reports.
- Managing the assigned work.

The following tasks outline the project management efforts required for completion of an RI/FS work assignment.

Task 8-1 - Project Initiation

Upon receipt of a work assignment, the following deliverables must be prepared and activities completed.

- Preparation of draft work plan.
- Review meeting with EPA and State personnel.
- Preparation of final work plan.
- Project kickoff meeting
- Preparation of project budget
- Preparation of project schedule
- Completion of Optional Form 60

Task 8-2 - Project Execution

During the execution of a work assignment, the following deliverables must be prepared and activities completed.

- Preparation of monthly technical status report.
- Preparation of monthly financial status report.
- Preparation of field work health and safety plan.
- Bimonthly RSPM review meetings.
- Surveillance of documentation and document control requirements.
- Update of community relations plan.
- Review of graphics standards for compliance with EPA standards.
- Preparation of technical task plans.
- Preparation of technical task completion memos.
- Preparation of remedial planning performance event report.

- o Preparation of a sampling and analysis plan and coordination of sampling and analysis work with EPA Region V.
- o Implementation of REM/FIT quality assurance program for project deliverables.

Task 8-3 - Project Close Out

At the completion of the work assignment, the following deliverables must be prepared and activities completed:

- o Preparation of draft work assignment completion report.
- o Preparation of final work assignment completion report.
- o Review of project budget.
- o Review of project schedule.

3.3.3 Remedial Investigation/Feasibility Study Estimated Costs/Schedule/Deliverables

Table 3-2 shows the estimated costs for the ECC site RI/FS activities. A preliminary time schedule is shown in Figure 3-5. The following deliverables will be provided for the activities outlined in the RI/FS scope of work.

ACTIVITIES	DELIVERABLES
Activity 1	1. Draft work plan for EPA review and comment. 2. Final work plan 3. Quality assurance project plan
Activity 2	1. Updated work plan 2. Summary report
Activity 3	1. Hydrogeologic study report 2. Groundwater sampling and analysis report 3. Surface water and sediment sampling and analysis report 4. Soil sampling and analysis report
Activity 4	1. Site hazard assessment report 2. List of potential operable units and remedial actions 3. Draft remedial investigation report for EPA review and comment 4. Final remedial investigation report

Table 3-2 (page 1 of 2)
ESTIMATED COSTS FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ECC SITE

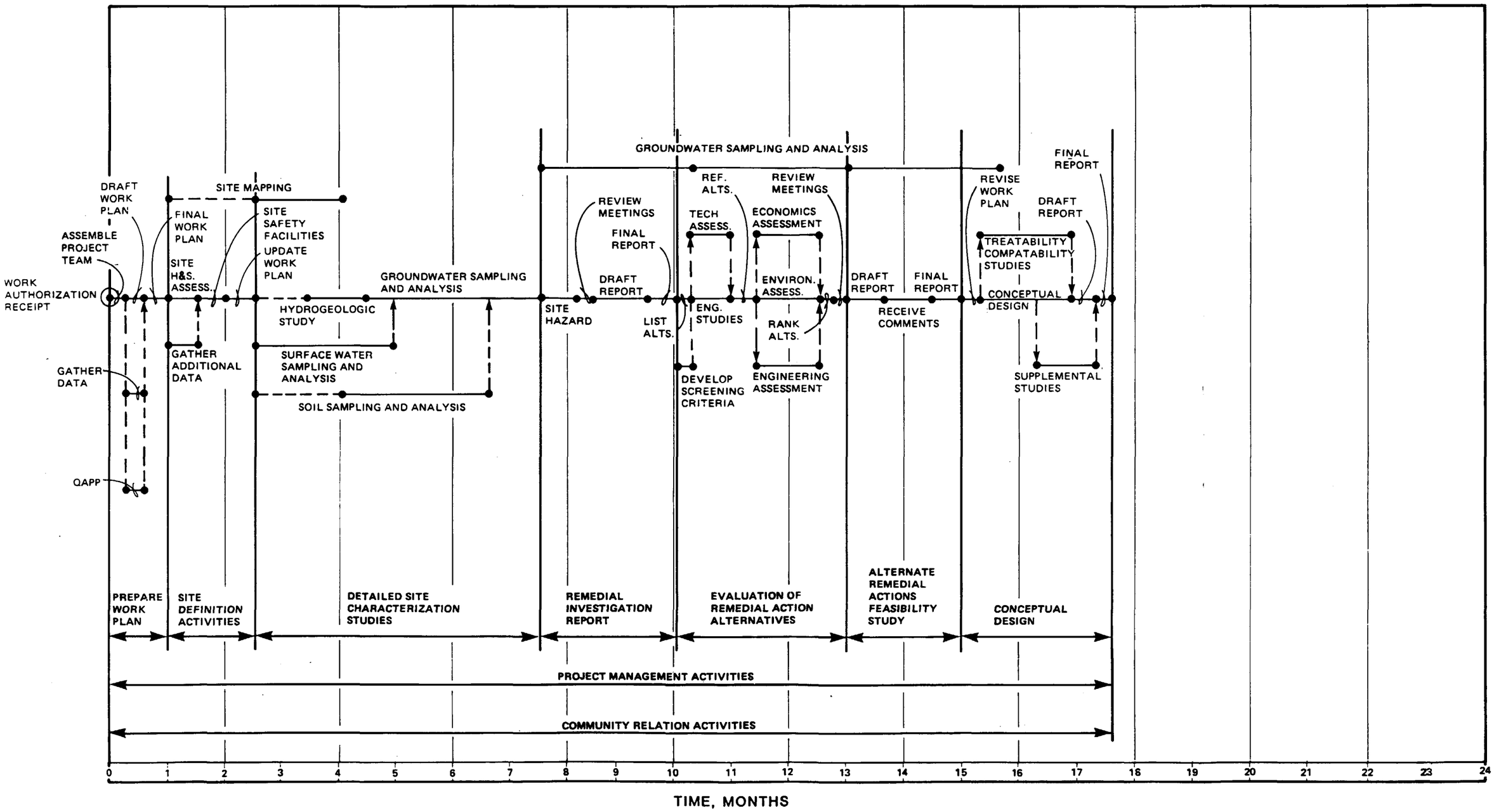
Activity	MINIMUM COST $Engineering	MINIMUM COST $Expense	MINIMUM COST $Subcontract	MAXIMUM COST $Engineering	MAXIMUM COST $Expense	MAXIMUM COST $Subcontract	ESTIMATED COST RANGE $Minimum	ESTIMATED COST RANGE $Maximum
1.0 WORK PLAN PREPARATION								
1-1 Assemble Project Team	800	100	0	1,600	200	0	900	1,800
1-2 Prepare Quality Assurance Plan	2,300	400	0	4,900	900	0	2,700	5,800
1-3 Work Plan	2,100	200	0	4,600	400	0	2,300	5,000
Subtotal	5,200	700	0	11,100	1,500	0	5,900	12,600
2.0 SITE DEFINITION ACTIVITIES								
2-1 Additional Data Gathering	3,100	900	0	6,700	1,800	0	4,000	8,500
2-2 Site Safety Facilities	2,800	7,700	0	6,000	16,500	0	10,500	22,500
2-3 Site H & S Assessment	700	100	2,900	1,400	300	6,200	3,700	7,900
2-4 Site Mapping	3,200	100	14,200	6,800	300	22,000	17,500	29,900
2-5 Update Work Plan	1,500	100	0	3,200	200	0	1,600	3,400
Subtotal	11,300	8,900	17,100	24,100	19,100	29,000	37,300	72,200
3.0 DETAILED SITE CHARACTERIZATION								
3-1 Hydrogeologic Study	12,300	6,000	37,400	26,500	12,800	80,100	55,700	119,400
3-2 Groundwater Sampling & Analysis	11,100	7,800	25,400	23,800	16,600	54,400	44,300	94,800
3-3 Surface Water Sampling & Analysis	1,500	400	9,200	3,200	900	19,800	11,100	23,900
3-4 Soil Samples & Analysis	6,600	1,800	35,600	14,200	3,900	76,300	44,000	94,400
Subtotal	31,500	16,000	107,600	67,700	34,200	230,600	155,100	332,500

GLT90/23-1

Table 3-2 (page 2 of 2)
ESTIMATED COSTS FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ECC SITE

Activity	MINIMUM COST $Engineering	MINIMUM COST $Expense	MINIMUM COST $Subcontract	MAXIMUM COST $Engineering	MAXIMUM COST $Expense	MAXIMUM COST $Subcontract	ESTIMATED COST RANGE $Minimum	ESTIMATED COST RANGE $Maximum
4.0 REMEDIAL INVESTIGATION REPORT								
4-1 Assess Site Hazards	1,200	100	0	2,600	200	0	1,300	2,800
4-2 Review Meeting	1,400	300	0	3,000	600	0	1,700	3,600
4-3 Prepare Report	2,600	600	0	5,500	1,200	0	3,200	6,700
Subtotals	5,200	1,000	0	11,100	2,000	0	6,200	13,100
5.0 EVALUATION OF REMEDIAL ALTERNATIVES	12,700	600	0	27,200	1,200	0	13,300	28,400
6.0 ALTERNATIVE REMEDIAL ACTIONS FEASIBILITY REPORT	8,600	800	0	18,600	1,800	0	9,400	20,400
7.0 CONCEPTUAL DESIGN	19,600	1,000	0	42,000	2,100	0	20,600	44,100
8.0 PROJECT MANAGEMENT	16,400	800	0	35,200	1,800	0	17,200	37,000
TOTALS	$110,500	$29,800	$124,700	$237,000	$63,700	$259,600	$265,000	$560,300

GLT90/23-2



– – – – – PREPARATION OF CONTRACT DOCUMENTS AND SUBCONTRACTOR SELECTION

DETAILED SITE CHARACTERIZATION STUDIES

FIGURE 3-5
APPROXIMATE SCHEDULE FOR
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ECC SITE

Activity 5	1. Listing of potential alternatives 2. Screening process report 3. Technology assessment report 4. Report on refining alternatives 5. Report on economic assessment 6. Environmental assessment report 7. Engineering assessment report 8. Report on comparative ranking of alternatives 9. Report on comparative ranking review process
Activity 6	1. Draft feasibility report for EPA review and comment 2. Final feasibility report
Activity 7	1. Draft conceptual design report for EPA review and comment 2. Final conceptual design report
Activity 8	1. See Section 3.3.2 - Activity 8 - Scope of Work

3.4 SOURCE CONTROL REMEDIAL ACTIONS

3.4.1 Objective

Source control remedial actions include measures to prevent, reduce, or eliminate contamination by either containing the hazardous wastes in place or removing them from the site. Appropriate actions will be formulated and analyzed in detail after sufficient data has been generated through the remedial investigations. The extent and nature of the remaining contamination, and if a significant public hazard or environmental problem exists at the site after completion of initial remedial measures will be determined.

If initial remedial measures are implemented as previously outlined, the remaining potential hazards, sources anticipated to be addressed in the source control remedial actions, will include:

- Contaminated site soils
- Contaminated groundwater
- Others identified in remedial investigation and feasibility studies

3.4.2 Remedial Action Alternatives

Alternative source control remedial actions that may be appropriate for the ECC site include:

- o No action (may apply to all or part of the actions).
- o Extensive monitoring of the site with no further removal or containment activities.
- o Containing contaminated subsurface areas and groundwater using a slurry wall and cap, or a well field with pumping, treatment, and reinjection.
- o Collecting contaminated groundwater with treatment or offsite disposal.
- o Surface water drainage control measures to prevent percolation or run-on and runoff. Collection for treatment or offsite disposal.
- o Excavation or containment of contaminated soils. Encapsulation onsite or removal offsite.
- o Dismantling structures, equipment, tanks, piping, etc., and leaving material onsite, or offsite disposal, or salvaging it.

3.4.3 Cost Estimates/Time Schedule

Sufficient data are not available to cost estimate the suggested source control remedial action alternatives. Following the completion of the tasks listed in Section 3 of this RAMP, cost estimates and tentative implementation schedules will be prepared for the suggested actions.

3.5 OFFSITE REMEDIAL ACTIONS

3.5.1 Objective

Offsite remedial actions include measures to mitigate the effects of hazardous waste contamination that have migrated beyond the site. Appropriate measures can be formulated and analyzed only after sufficient data are generated through the remedial investigations to determine the extent and nature of offsite contamination, and to determine if a significant public or environmental health hazard or problem exists offsite. Offsite control remedial measures may not be appropriate if the degree of contamination does not pose a health or safety hazard.

3.5.2 Remedial Action Alternatives

Based on the results of the remedial investigations the following offsite remedial measures may be appropriate for the ECC site.

- o No action (may apply to all or part of the actions).
- o Offsite monitoring with no other mitigative measures.
- o Limited access to contaminated offsite areas (with or without monitoring).
- o Abandonment and plugging of downgradient, water supply wells and providing an alternative water supply.
- o Containing contaminated groundwater by using a slurry wall and cap, or a well field with treatment and reinjection.
- o Collecting contaminated groundwater for treatment or offsite disposal.
- o Containment onsite or removal of contaminated soils or sediments to an approved disposal area.

3.5.3 Cost Estimates/Time Schedule

Sufficient data is not available to cost estimate the suggested offsite remedial action alternatives at this point. Following the completion of the tasks listed in Section 3 of this RAMP, cost estimates and tentative implementation schedules will be prepared for the suggested actions.

GLT90/3

4.0 COMMUNITY RELATIONS ASSESSMENT

The community relations assessment summarizes current community attitudes and perceptions regarding the site. It then outlines actions to be taken during the IRM and RI/FS phases of the site work. The U.S. EPA will have primary responsibility for implementation of the community relations plan. Specific community relations activities and staff assignments will be included in the work plan prepared after the State contract has been completed. Information for this assessment was collected in discussions with representatives of U.S. EPA, Region V, ISBH staff, local citizens' adjacent property owners groups, and elected officials.

4.1 COMMUNITY RELATIONS BACKGROUND

4.1.1 History of Community Relations Activities

In November of 1975, a Boone County farmer reported the death of a calf and illness of calves that drank water from Finley Creek, downstream from Northside Sanitary Landfill. State agencies investigated and found no evidence that water from Finley Creek was the cause of the calf's death. Inspection of the landfill revealed no traces of any pollutant runoff to Finley Creek from the landfill.

In 1977 when ECC initiated operation, there were numerous complaints of air pollution and odor from residents. During the year, a new zoning ordinance went into effect in Boone County. All 72.5 acres of the ECC/Northside Sanitary Landfill site were zoned for heavy industrial use, but only 48.6 acres were permitted to be used as a landfill. The landowner requested a special permit to expand the Northside Sanitary Landfill operation to the remaining portion of the site. Local residents opposed the expansion and it was turned down at the county level. (The county denial of the permit was overturned by court action in 1980.)

In May 1979, a DePauw professor studying fish population in Central Indiana noted fewer species and numbers in the Finley Creek area just downstream of the ECC/Northside Sanitary Landfill. He stated that this sampling station gave indication of severe pollution. In response to an unrelated discharge of wastewater, the State cited ECC violations and ordered ECC to submit accurate monthly hauling and receiving reports.

In July 1979, a private citizen reported a minor oil spill into an unnamed ditch leading to Finley Creek. The State requested removal of the spill. While conducting a followup investigation on August 2, the State learned that process and cooling water containing oil and suspended solids had been intentionally discharged by ECC into a ditch leading to

Finley Creek. The State requested oil removal. As a result, the staff of the Stream Pollution Control Board (SPCB) requested a hearing on the spill and discharge incidents, but the matter was tabled. ECC developed a spill prevention control and countermeasure plan that was accepted by the State.

During 1980, extensive water sampling at the site was completed. Relatively high concentrations of inorganic substances were detected in ECC lagoon samples. U.S. EPA documented remedial measures to be taken by ECC to eliminate leachate problems at the site.

Early in February 1981 at a public hearing, local citizens strongly opposed expansion of the landfill site to 104 acres north of the existing site. The zone change request was tabled (and later denied). Several days later, an ECC employee died of exposure to toxic vapors after entering a solvent tanker. The State conducted soil and water sampling following the incident. Three organic solvents (1,1 Dichloroethane, Trichloroethene, and 1,1,1 Trichloroethane) were found in groundwater samples. No contamination of residential wells in the area was discovered. U.S. EPA filed a RCRA Inspection Report and cited violations relating to drum storage. Indiana Occupation Safety and Health Administration (IOSHA) fined ECC $28,800.

As a result of an enforcement action initiated in early 1981, the Environmental Management Board (EMB) and ECC signed an agreed order which placed the company in receivership and prohibited ECC from using the Northside Sanitary Landfill for disposal of waste it had generated. It imposed a civil penalty of $50,000 and gave ECC until November, 1981 to return to complete compliance with all environmental laws and regulations. This deadline was not met. In May 1982, the Circuit Court ordered ECC to close and environmentally secure its site.

During fall 1982, after contact from concerned citizens, U.S. Senators Lugar and Quayle expressed concern to U.S. EPA over the ECC situation and requested consideration of the site for cleanup under the Superfund program. U.S. EPA reviewed sample data from the cooling water pond and a residential well near the ECC site and determined that the low levels of contaminants detected did not represent a risk deviating significantly from the norm. The Indianapolis Water Company expressed concern to the State over possible contamination of drinking water. The letter was included as part of a news report on Channel 13 in Indianapolis. Indiana's Attorney General began pursuit of site cleanup by the waste generators.

Table 4-1
ECC SITE COMMUNITY RELATIONS PLAN

Community Relations Activities	Technical Elements: Final Community Relations Plan	Initial Remedial Measures	Remedial Investigation	Feasibility Study
1. Community Orientation	*			
2. Initial Press Briefing	*			
3. Coordination with Citizen Groups and Elected Officials	On-Going			
4. Local Briefings, Press Releases, and Fact Sheets	On-Going			
5. Community Meetings (Optional)			*	*

GLT90/26

APPENDIX A

SITE VISIT MEMORANDUM

AND PHOTOGRAPHS

MEMORANDUM

TO: File

FROM: Dennis E. Totzke
Remedial Site Project Manager

DATE: January 27, 1983

JOB NO: W65130.00

SITE NO: 01-5V30.0

On January 20, 1983, I and the following persons participated in a site visit at the Environmental Conservation and Chemical Corporation (ECC) facility in Zionsville, Indiana.

Jerry Bills	CH2M HILL
Phil Smith	CH2M HILL
Jonas Dikinis	U.S. EPA, Region V
Robert Fricke	Ecology and Environment, Inc.
Jim Knoy	Indiana State Board of Health

Three vehicles were driven near the site and parked outside the main entrance to the site. The site safety plan classified the site as a "Level C" area.

The following comments reflect the observations of the CH2M HILL members of the visitation team:

1. Drums are located throughout the site in various storage configurations. Most are stacked three to four high while others are lying about haphazardly.

2. Numerous bulging drums were observed, indicating the buildup of internal pressure.

3. Numerous punctured or open drums were found.

4. A large number of bulk tanks are located throughout the site. In many instances, they are surrounded by stacks of drums. These bulk tanks are reportedly full or nearly full.

5. Many of the drums are situated in standing water. The submerged portions of these drums exhibit signs of corrosion.

6. A sandbag dike has been installed on the east side of the cooling water pond to contain the pond liquids. However, water still appears to be escaping from the site despite the sandbagging efforts.

7. Chemical plumes were observed in the onsite standing water, indicating leaking of drum contents.

8. In several onsite locations, drums have been segregated and assembled in groups. Either additional drums are being brought onto the site or someone has attempted to segregate and remove drums.

9. Throughout our 1-hour visit, the HNU indicated the presence of measurable levels of organic vapors.

10. The level in the cooling water pond is about 2 feet below the top of its impoundment. This low level is the result of the large volume of pond water that has been converted to ice by the pond aeration system.

11. The creek that borders the east boundary of the ECC site appears to be discolored with contaminants. The source of the contaminants is not known.

12. The south pad (concrete) was reportedly built over a well(s). It is not known if the well(s) was properly closed off.

13. There is a monitoring well near the southeast corner of the ECC site. The well is located on the property of the Northeast Sanitary Landfill.

14. A large number of drums are located outside the main gate to the site. Some were observed to be empty. Others may be full.

15. Animal tracks were observed in the snow on the site. The fence around the site is not very secure.

16. Odors from the site could be detected in the air upon arrival at the site.

17. Large amounts of airborne particulates are generated south of the site by the heavy truck traffic going in and out of the municipal landfill.

18. A spring bubbles out of the ground approximately 10 to 20 yards off the southwest corner of the site. The banks of the rivulet leading to Unnamed Ditch are heavily stained.

Enclosed is a series of photographs, location map, and an accompanying log, taken during the site visit.

GLT90/2

Enclosures

PHOTO LOG
ECC
January 20, 1983
W65130.00

Photo No.	Description
1 - 3	Overexposed.
2	CH2M HILL personnel enroute to site.
4	View of office building looking through main gate. Site visit participants visible in foreground.
5	View of main gate and parking area looking due south from the dike. This photo is the first in a series of five photos which scan the site (180°) from this position.
6	View of office and cooling water pond looking in a southeast direction. The southern drum storage pad is also visible (center).
7	View of trailer and process building looking east towards the cooling water pond (right). A portion of the solidification pit is also visible (left).
8	View of process building and immediate surroundings including surface storage tanks and miscellaneous drums looking in a northeast direction from the dike.
9	Head-on view of western stretch of the dike looking north. This photo completes the scan.
10	View of process building and solidification pit from a second position atop the dike looking east.
11	Closeup view of solidification pit looking in a northeast direction from the dike. Process building in background.
12	View of site visit participants atop the dike looking due north from the dike.
13	View of parking area and road looking in a southeast direction from a point west of the main gate area. This is the first photo in a series of four (Nos. 13-16) which scan the site from this position.

14	View of crane and pile of drums outside main gate.
15	View of main gate and office looking northeast. Process building is also visible (left).
16	View of western stretch of dike looking approximately north. Process building is visible at far right.
17	View of southern portion of the southern drum storage pad looking almost due south from a position located on NSL. This photo is the first in a series of shots (17-31) which complete a 360° scan from this position.
18	View of southern drum storage pad looking approximately west. A-frame office building is visible in the center of the photo.
19	View of process building and northern drum storage area as well as the cooling water pond (center left) looking in a northwest direction.
20	Overexposed. (View of south drum storage pad.)
21	Overexposed. (View of cooling pond and north drum storage area.)
22	Overexposed. (View looking north-northwest. North drum storage area is visible on extreme left.)
23	View of the NSL property looking due north.
24	View of the southern drum storage pad in its entirety.
25	View of northern half of the site looking in a northwest direction. Visible are the cooling water pond (left), the process building (center), and the northern drum storage pad (right).
26	View of NSL (foreground) looking approximately north. ECC's northern drum storage pad is visible, (left).
27	View of NSL looking due north.

28	View of NSL looking in a northeast direction.
29 - 30	View of NSL looking in a southeast direction.
31	View of central portion of the site looking due west from the landfill. The cooling water pond is visible, center. This photo completes the 360° scan from this position.
32 - 33	Closeup views of the unnamed ditch/creek as it flows under the landfill driveway.
34 - 35	Views of the unnamed ditch/creek looking north.
36	View of southern boundary of southern drum storage pad looking due north.
37	View of southern drum storage pad looking due east at the gated entrance.
38	Closeup view of water in the unnamed ditch. Unexplained bubbling (not visible in photo) was observed to be occurring at this location.
39	Overexposed.
40	CH2M HILL personnel enroute to site.
41	View of north end of southern drum storage pad looking due south from a location central to the site. This is the first photo of a series of five (Nos. 41 - 45) which complete a 180° scan of the site from this location.
42	Another view of the north end of the southern drum storage pad, this time looking in a southwest direction.
43	View of cooling water pond and miscellaneous drums looking due east.
44	View of cooling water pond looking in a northeast direction.
45	View of south end of process building looking north.
46	View of site through main gate looking approximately north.

47 - 48 View similar to photo No. 11 showing the solidification pit.

49 View of southern drum storage pad and office building looking in a southeast direction from the dike.

50 View of surface storage tanks surrounding the process building looking due east from the dike.

51 View of surface storage tanks surrounding the process building and the northern drum storage area looking in a northeast direction from the dike.

52 Closeup view of surface storage tanks surrounding the process building looking in a southeast direction.

53 View of process building and surrounding surface storage tanks looking south from the northwest corner of the dike. This is the first of a series of four photos (Nos. 53 - 56) which complete a 90° scan of the site from this location.

54 View of process building and surrounding storage tanks as well as the northern drum storage area looking in a southeast direction from the site.

55 View of the northern drum storage area and surface storage tanks looking in a southeast direction from the dike.

56 View of the northern boundary of the site looking due east across the northern stretch of the dike.

57 View of northwestern portion of the site looking due south toward the process building.

58 View of the north end of the process building looking due south from the dike towards the northern drum storage areas.

59 View of residence just north of ECC looking north from the dike.

60 View of northern portion of the site showing the drum storage area and process building. Photo was taken looking due south from the dike.

61 View of the northern drum storage area looking in southeast direction from the dike.

62 View of miscellaneous drums piled on the dike on the northeast corner of the property looking due east.

63 View of northeast corner of the ECC property looking in a southwest direction from the northeast corner of the dike. This is the first in a series of photos (Nos. 63-68) which scan the area from this location.

64 View of the northeast corner of the ECC property showing the eastern stretch of the dike.

65 View of process building and drum storage area from the northeast corner of the site looking in a southwest direction.

66 View of the northern boundary of the site looking almost due west along the northern stretch of the dike.

67 View of the unnamed ditch looking in a southeast direction.

68 View of drums in the storage area standing in water at the northeast corner of the dike.

69 Close up of drums just within the dike on the east side of the site.

70 View of unnamed ditch looking due east from the dike.

71 View of the cooling water pond. The sprays of frozen water visible (center), were caused by utilizing the aeration system during subfreezing temperatures.

72 View of the unnamed ditch looking due east from the dike.

73 View of the northern drum storage area looking in a northwest direction from the dike. This is the first photo in a series (Nos. 73 - 76, 78) which completes a scan of the site from this location.

74 View of the northern storage area pond and process building looking due west from the dike.

75	View of the barbed wire fence between ECC and NSL properties looking in a southeast direction from the dike. Sand bags in center of photo were placed to stop the north drum storage area pond from overflowing to the unnamed ditch.
76	View of frozen water looking in a westerly direction from the site.
77	Poorly developed.
78	View of a portion of the drum storage area bordering the cooling water pond.
79 - 88	These photos were taken offsite near an inactive asphalt operation where suspected dumping of possibly hazardous waste is thought to have occurred.

GLT90/25

(1)

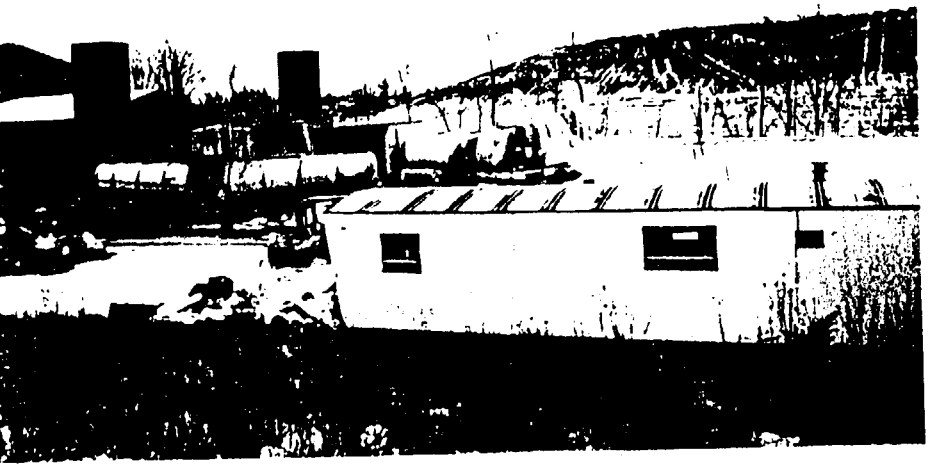
(2)

(3)

(4)

5

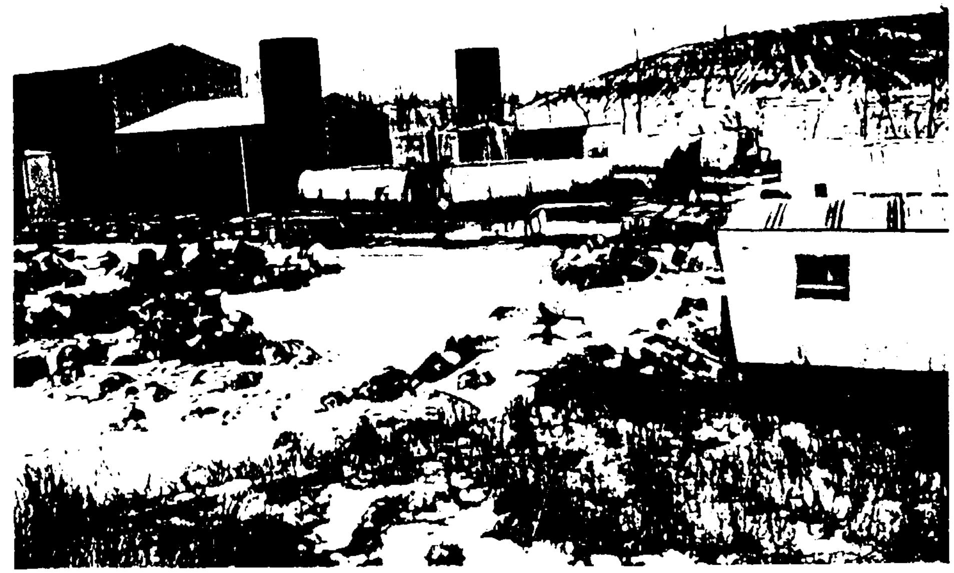
6



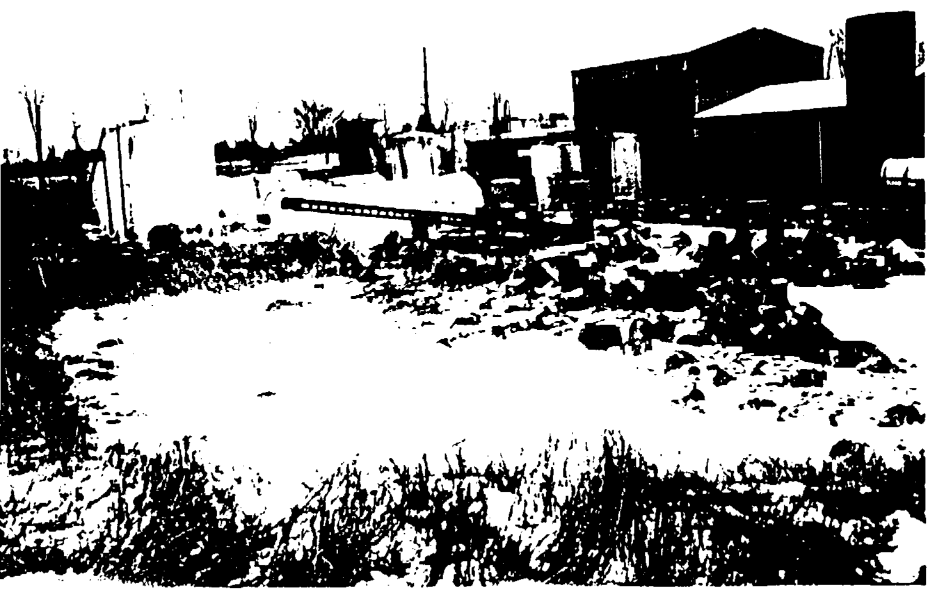
7

8

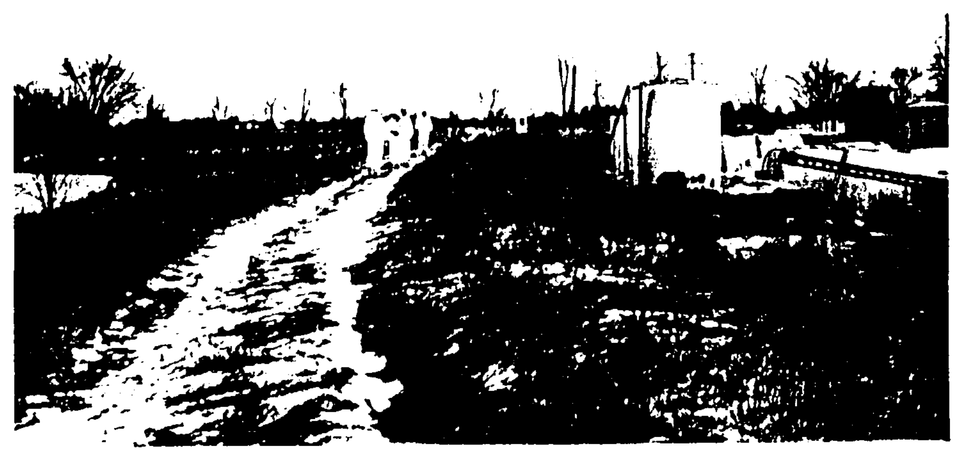
9



10

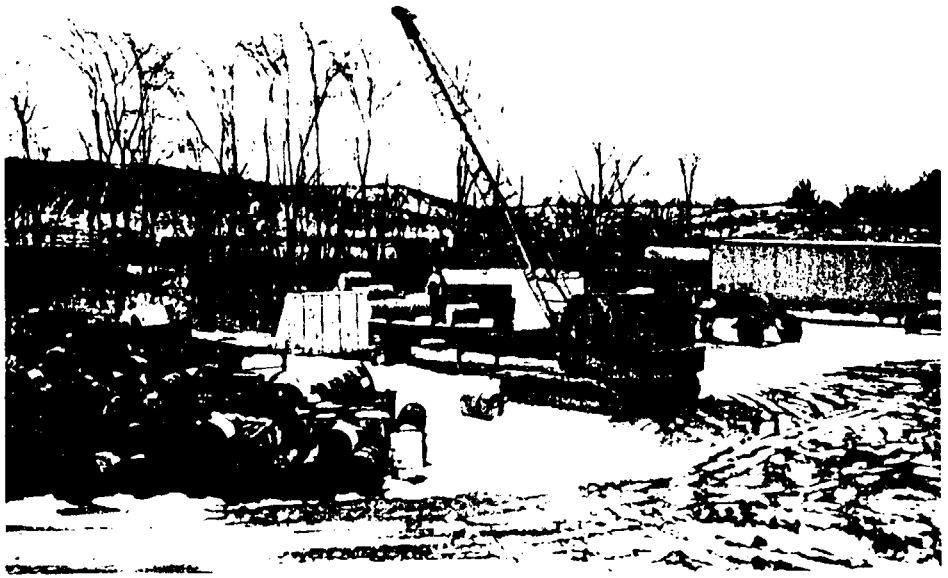


11



12

13



14

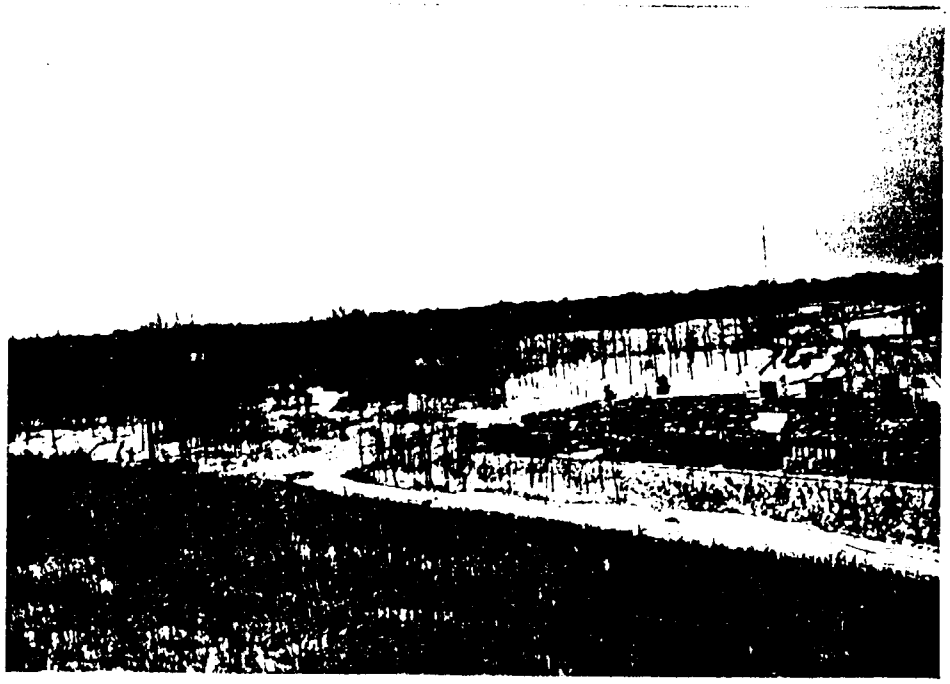
15

16

17

18

19



20

21

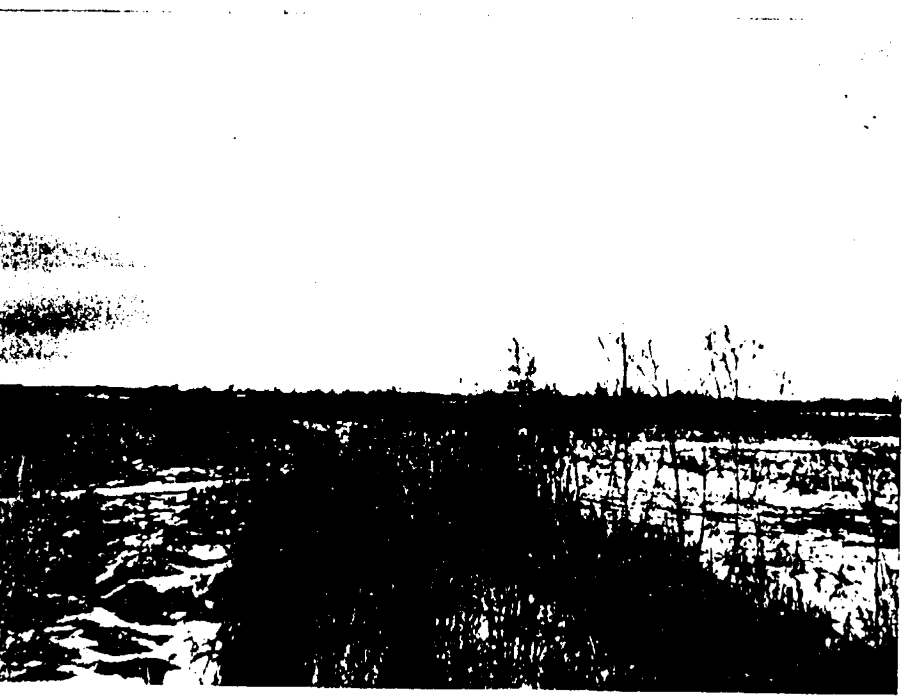
22

23

24

(25)

(26)



(27)

(28)

29

30

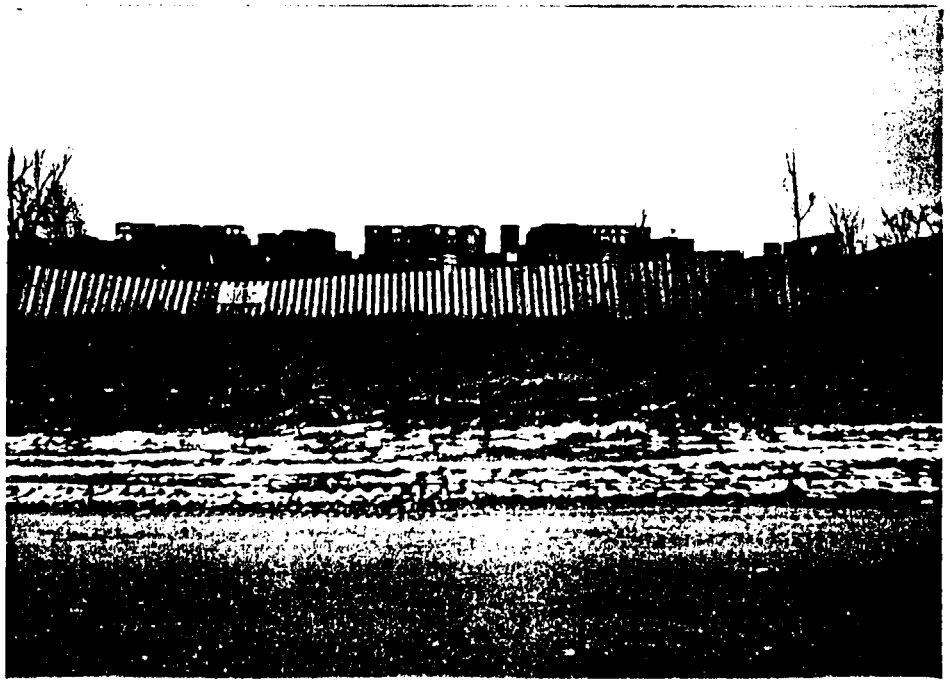
31

32

33

34

35



36

37

38

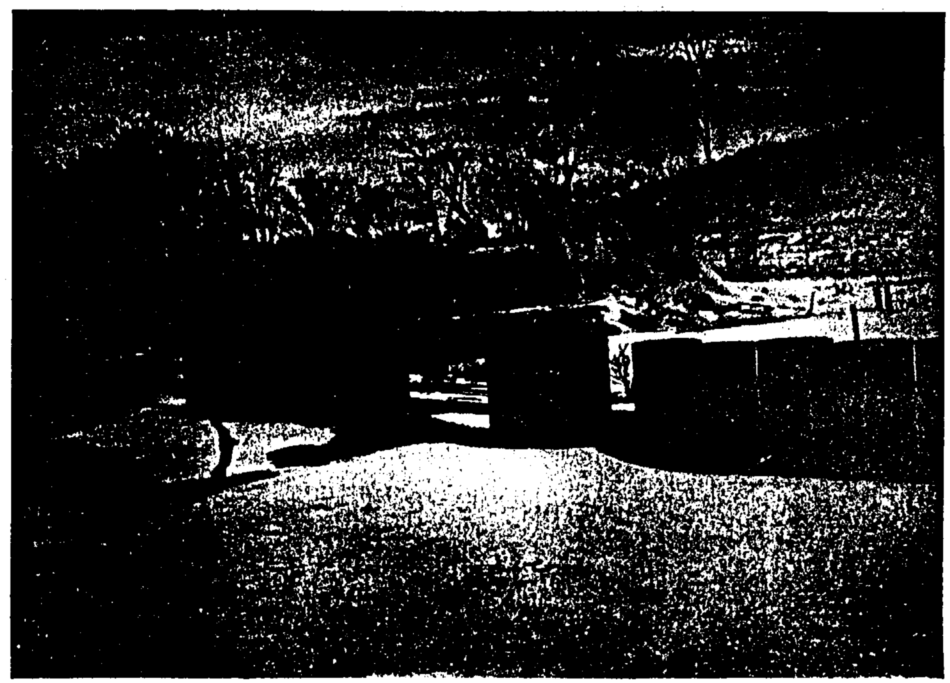
39

40

41

4

43



4

45

46

47

48

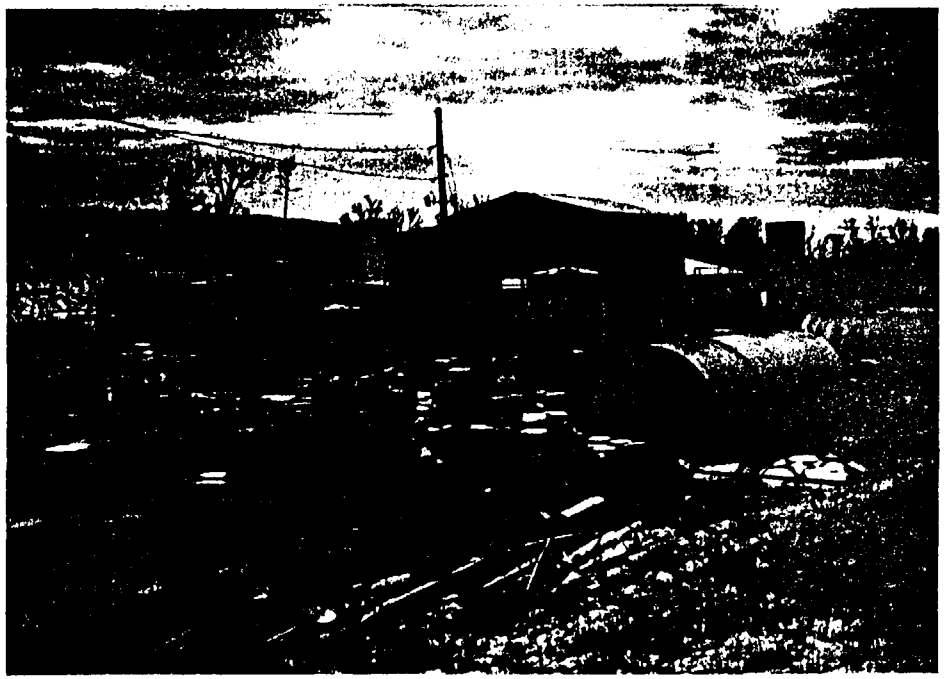
49

50

51

52

53

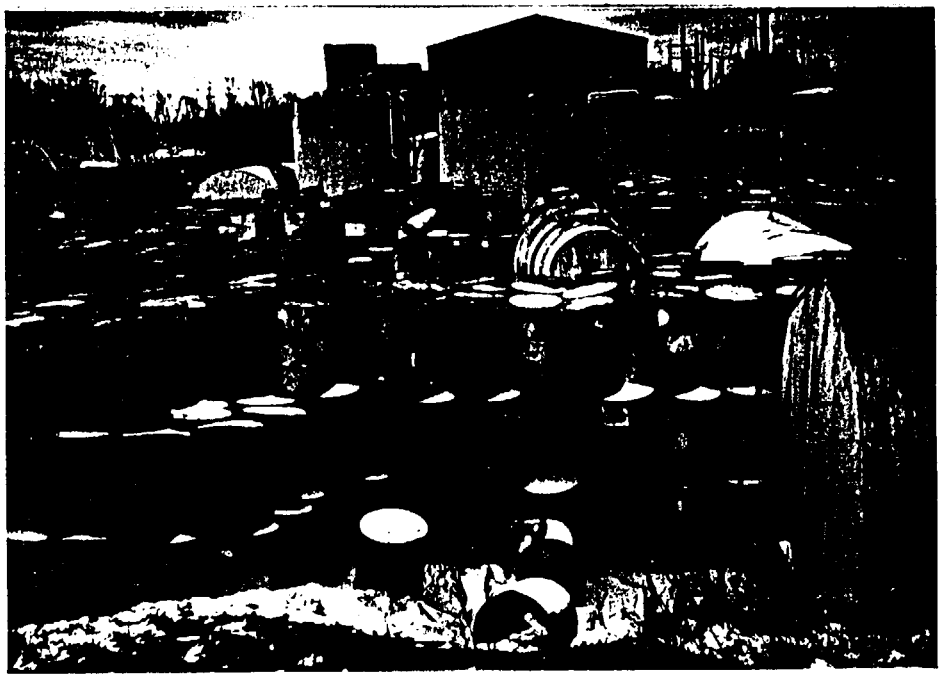


54

55

56

57



58

59

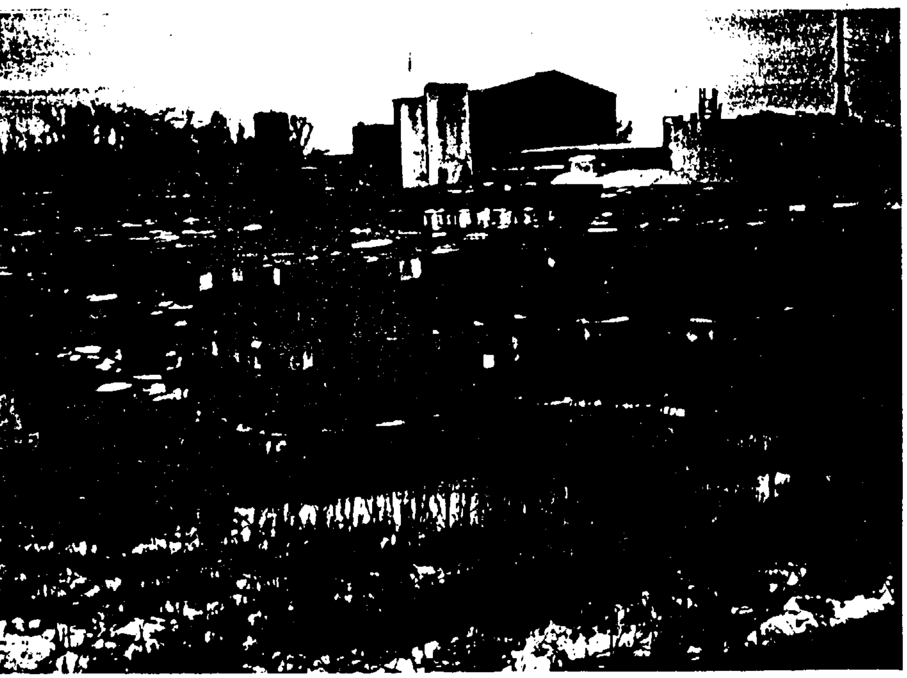
60

61

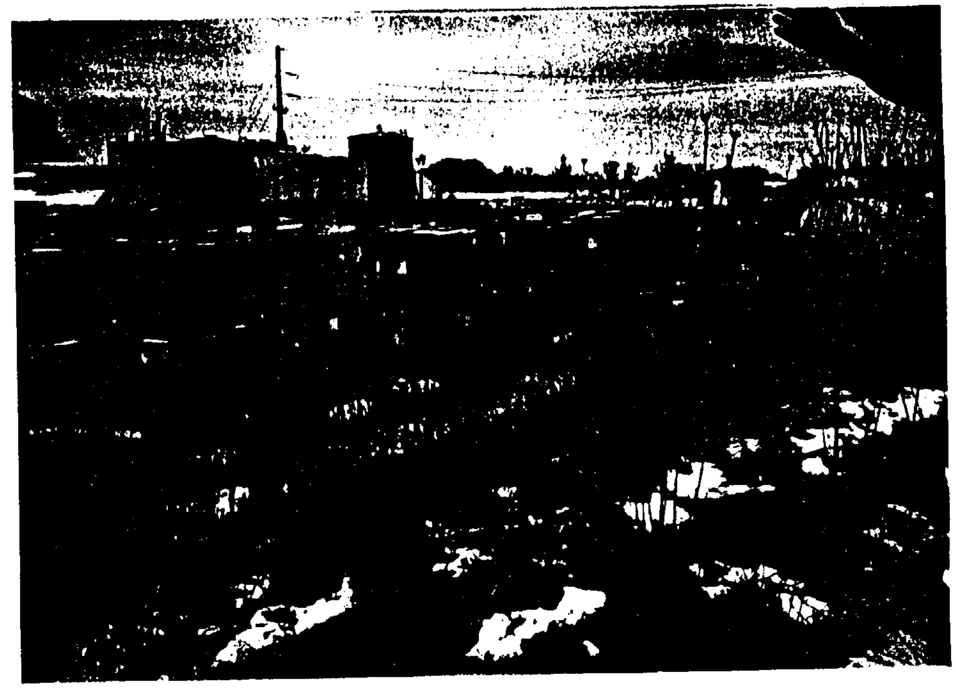
62

63

64



65



66

67

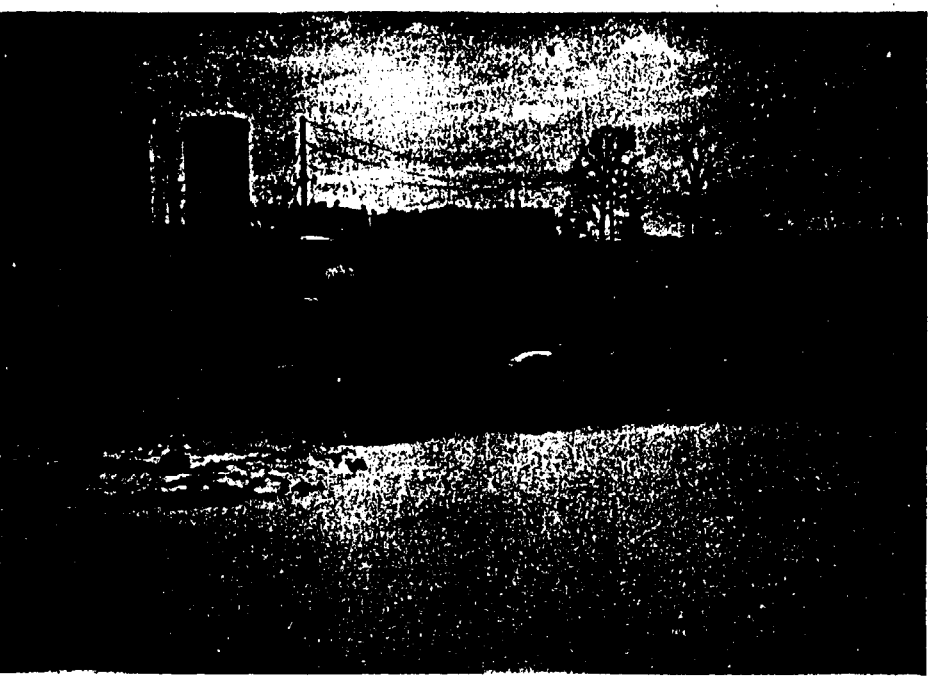
68

69

70

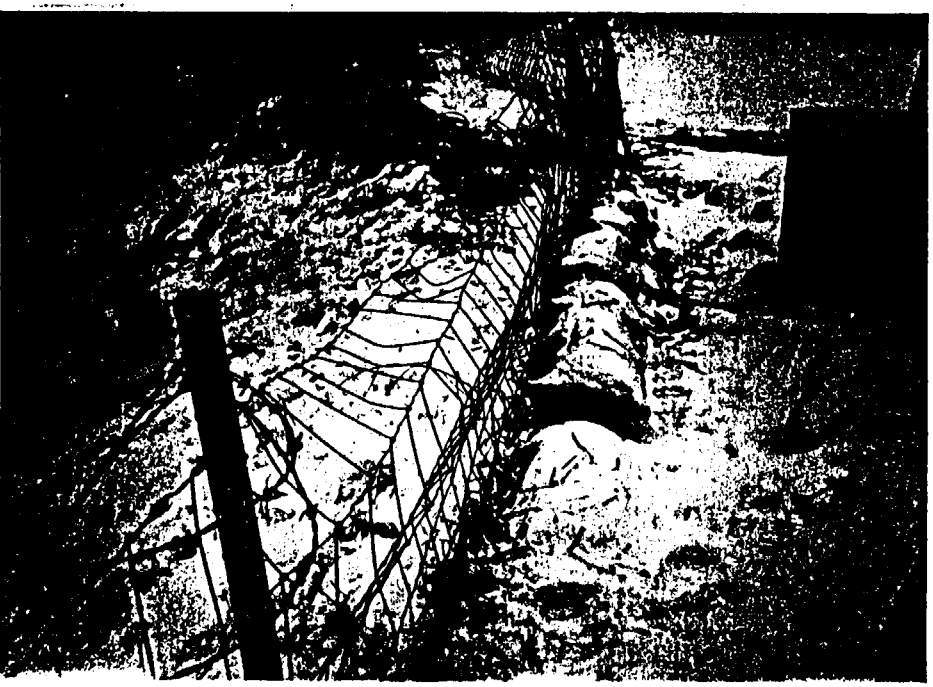
71

72

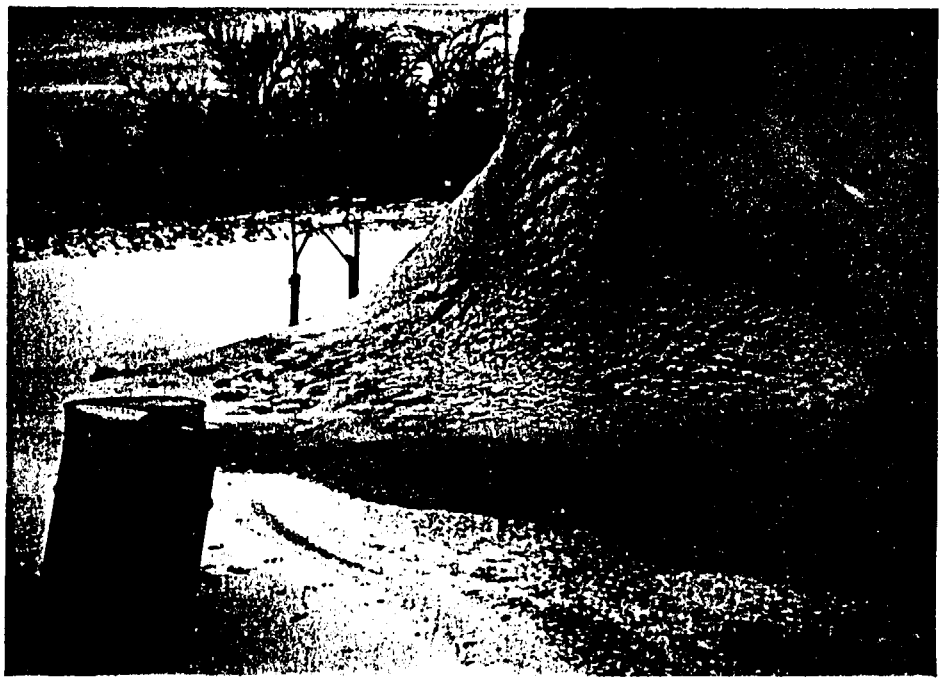


73

74



75



76

77

78

79

80

APPENDIX B

SITE CHRONOLOGY

INTRODUCTION

The following site chronology is intended to serve as a general summary and order of events of known activities at or concerning the site. It is a date-by-date compilation of information obtained by reviewing CH2M HILL files containing available correspondence, reports and documents pertinent to the site. For cross reference purposes, each entry has been labeled with a document number. This number reflects its source of origin in the CH2M HILL files. In addition, each entry has been assigned a key word to quickly characterize the type of event discussed in the entry.

CHRONOLOGY FILE

Date: 05/05/77
Document No.: 0040
Key Word: Legal Action
Description: APCD issues a permit "to construct a solvent recovery facility," namely ECC.

Date: 08/00/77
Document No.: 0010
Key Word: Site Data
Description: ECC begins operation as a waste storage and recycling business in Boone County, 865 South U.S. 421, Zionsville, IN.

Date: 12/15/77
Document No.: 0153
Key Word: Site Data
Description: ECC requests approval to dispose of 5,000 gallons per month of wastewater (from an oil reclamation process) at the Northside Sanitary Landfill. Construction on this project was completed in March 1978; however, their request for disposal was denied on April 11, 1978.

Date: 01/22/79
Document No.: 0062
Key Word: Site Visits
Description: ISBH personnel conduct an inspection of ECC to review the company's waste treatment facilities. Inspection was conducted in response to the company's proposed land application of oil treated wastewater.

Date: 03/23/79
Document No.: 0025

Key Word: Site Data
Description: SPCB receives plans and specifications for wastewater treatment facilities at ECC.

Date: 04/17/79
Document No.: 0040
Key Word: Legal Action
Description: SPCB staff orders that a hearing be scheduled to resolve issues around SPC-17 reporting violations made by ECC.

Date: 05/30/79
Document No.: 0032
Key Word: Legal Action
Description: SPCB files a Notice of Hearing and Complaint against ECC in regards to violations of SPC 17. ECC was ordered to submit accurate monthly hauling and receiving reports in accordance with the regulation and was fined $400.

Date: 06/20/79
Document No.: 0061
Key Word: Legal Action
Description: J. Reynolds (SWMS) submits to S. Zlatos (OAG) a list of actions believed sufficient to prove ECC's intent to improve its operation and abide by regulations.

Date: 07/03/79
Document No.: 0025
Key Word: Legal Action
Description: SPCB offers no objection to wastewater treatment facilities at ECC as proposed to them in plans and specifications received March 23, 1979. The proposed system was to have been a "closed" system without net excess wastewater discharge.

Date: 07/31/79
Document No.: 0027
Key Word: Site Data
Description: T. Berger, private citizen, reports an oil slick on Eagle Creek, north of Zionsville, to the ISBH. Immediate investigation revealed that the oil (waste oil) had originated from ECC and a minor amount from the Northside Sanitary Landfill. ECC agreed to take action to recover the oil.

Date: 08/02/79
Document No.: 0028
Key Word: Site Data
Description: While conducting a followup investigation of the 7/31/79 oil spill, D. Shipe (ISBH) discovered that ECC intentionally discharged process and cooling water from a storage pond to Finley Creek. Water samples and photographs were taken. Shipe suggested that enforcement action was warranted for failure to have a NPDES permit and for violations of SPC 16 and SPC IR-4.

Date: 11/30/79
Document No.: 0036
Key Word: Site Data
Description: ECC submits its Spill Prevention Control and Countermeasure Plan.

Date: 12/00/79
Document No.: 0037
Key Word: Site Data
Description: EPA designates ECC as a potential hazardous waste site.

Date: 12/10/79
Document No.: 0038
Key Word: Sampling/Testing
Description: J. R. Gammon (Prof. of Zoology, DePauw Univ.) contacts O. Hert (SPCB) in regards to the condition of Finley Creek explaining that he has been monitoring aquatic communities at a station immediately downstream of the landfill as part of a study on Eagle Creek Watershed. Gammon says that the lack of low diversity, and low population of aquatic life he observed at this station gives indication of severe pollution and believes that seepage and/or runoff from the dump is responsible.

Date: 01/03/80
Document No.: 0039
Key Word: Site Data
Description: O. Hert (SPCB) grants ECC permission to dispose of 2,000 cu. yds. of oil and paint contaminated soil at Northside Sanitary Landfill on a one time only basis.

Date: 02/04/80
Document No.: 0035
Key Word: Sampling/Testing
Description: ISBH Water Laboratory reports results of SWMS's 11/2/79 water sampling at ECC. Relatively high concentrations of arsenic, cadmium, chromium, lead, nickel, oil and grease, phenol, and zinc were detected in pond samples.

Date: 02/13/80
Document No.: 0040
Key Word: Legal Action
Description: SWMS is notified by the Industrial Hygiene and Radiological Health Division that they had received complaints of violations of OSHA regulations and hazardous working conditions at ECC.

Date: 03/12/80
Document No.: 0043
Key Word: Site Visits
Description: R. A. Shandross and R. Karl (SWMS) and U.S. EPA personnel along with ECC management personnel participate in an investigation of ECC to gather information on site conditions and operations with respect to hazardous waste management, for the purpose of evaluation of potential hazards to the environment and/or health.

Date: 04/03/80
Document No.: 0045
Key Word: Sampling/Testing
Description: SWMS conducts water sampling of discharge from south drum storage area of ECC.

Date: 04/10/80
Document No.: 0043
Key Word: Site Visit
Description: U.S. EPA personnel conduct a reconnaissance inspection of the site including an assessment of the potential for spills, runoff and fires. Samples were collected at 7 locations on the site.

Date: 04/17/80
Document No.: 0153
Key Word: Legal Action
Description: Staff from the Bureau of Engineering of

the ISBH document ECC violations of the Environmental Management Act, the Air Pollution Control Law, the Stream Pollution Control Law, and Regulations promulgated under these laws.

Date: 05/20/80
Document No.: 0055
Key Word: Site Visits
Description: U.S. EPA visits ECC to investigate whether the facility is in violation of the Clean Water Act of 1977 (CWA) P.L. 95-217 Section 311.

Date: 06/02/80
Document No.: 0056
Key Word: Legal Action
Description: ECC requests the opportunity to have the EMB or some of its members visit the facility on July 11, 1980, to see for themselves that they are making the necessary improvements. This was done in reaction to the EMB action against ECC in hopes of reaching an out-of-court agreement with the board.

Date: 09/05/80
Document No.: 0071
Key Word: Sampling/Testing
Description: SWMS conducts water quality study sampling of private wells in the vicinity of ECC.

Date: 09/08/80
Document No.: 0065
Key Word: Legal Action
Description: G. H. Madany (EPA) documents remedial actions to be taken by ECC to eliminate leachate problems at the site. Madany requested ECC submit a plan of action within 45 days.

Date: 02/09/81
Document No.: 0101
Key Word: Site Data
Description: ECC employee dies of exposure to toxic vapors after entering a solvent tanker.

Date: 02/12/81
Document No.: 0077
Key Word: Community Relations
Description: The Reporter prints "Enviro-Chem Puts No Blame on Accident But Cites Possible

Fallacies."

Date: 02/28/81
Document No.: 0082
Key Word: Community Relations
Description: The Star prints "Two Streams Near Zionsville to be Tested for Pollutants."

Date: 03/04/81
Document No.: 0089
Key Word: Site Visits
Description: U.S. EPA conducts site inspection and files RCRA Inspection Report - Interim Status Standards; Treatment, Storage, and disposal facilities.

Date: 03/05/81
Document No.: 0096
Key Word: Site Data
Description: ISBH meets with representatives of several municipal agencies and the Indianapolis Water Company to review data available from past stream sampling around the Northside Sanitary Landfill and ECC.

Date: 03/05/81
Document No.: 0101
Key Word: Sampling/Testing
Description: ISBH conducts water sampling at residential wells around the Northside Sanitary Landfill and ECC.

Date: 03/06/81
Document No.: 0091
Key Word: Community Relations
Description: The Indianapolis Star prints "Attorney General Orders Probe of Enviro-Chem Corporation."

Date: 03/06/81
Document No.: 0092
Key Word: Community Relations
Description: The Reporter prints "Attorney General Enters Enviro-Chem Corporation Probe."

Date: 03/06/81
Document No.: 0084
Key Word: Site Data
Description: J. T. Fitch (SWMS) submits: RCRA Inspection Report - Interim Status Standards Treatment, Storage, and Disposal Facilities.

Date: 03/10/81
Document No.: 0094
Key Word: Community Relations
Description: City & State prints "State Tests Streams Near Enviro-Chem."

Date: 03/10/81
Document No.: 0113
Key Word: Sampling/Testing
Description: ISBH undertakes stream and sediment sampling in Finley Creek and the unnamed ditch adjoining ECC and the Northside Sanitary Landfill properties. A total of 17 water samples and 18 sediment samples were collected.

Date: 03/17/81
Document No.: 0085
Key Word: Community Relations
Description: The Reporter prints "Enviro-Chem Fined $28,800 by IOSHA."

Date: 03/17/81
Document No.: 0097
Key Word: Community Relations
Description: The Reporter prints "Plant Inspection Pending; Enviro-Chem Fined $28,800 by IOSHA," as well as, "Commissioners Deny Request on Landfill Rezoning."

Date: 04/14/81
Document No.: 0102
Key Word: Sampling/Testing
Description: C. N. Ott (ISBH) reports that chemical analyses have been completed for the nine residential wells sampled on 3/5/81 around the Northside Sanitary Landfill and ECC. He states that analyses do not indicate the presence of any material not normally found in groundwater in that area of the state and concludes that the wells do not appear to be contaminated by leachate at this date.

Date: 04/28/81
Document No.: 0105
Key Word: Site Visits
Description: EMB conducts an inspection of the ECC barrel storage facility and discovers conditions in violation of RCRA and of the Environmental Management Act.

Date: 05/13/81
Document No.: 0111
Key Word: Site Visits
Description: EMB inspects ECC's barrel storage facility to review progress made in eliminating violations cited in the 4/22/81 inspection. Inspection showed that the number of leaking and "popped top" containers were reduced in number as ordered.

Date: 05/19/81
Document No.: 0115
Key Word: Site Visits
Description: G. J. Hauvermale and K. M. Simonson (Boone County Public Health Department) visit ECC to inspect the level of surface water being retained in the southeast corner of the barrel storage area.

Date: 06/12/81
Document No.: 0123
Key Word: Site Visits
Description: EMB re-inspects the barrel storage facility at ECC. It was noted that there were no leaking barrels and only four "popped top" barrels in the facility.

Date: 06/22/81
Document No.: 0117
Key Word: Community Relations
Description: Indianapolis Business Journal prints "Enviro-Chem: The Controversy Burns On."

Date: 06/25/81
Document No.: 0124
Key Word: Site Visits
Description: P. Rarick (OAG) and T. Fitch (SWMS) conduct an inspection of the ECC processing area to determine the progress made in up-grading the barrel storage facility.

Date: 07/01/81
Document No.: 0120
Key Word: Legal Action
Description: The Boone County Circuit Court issues a Consent Decree containing essentially all items of the originally proposed decree with the addition of an imposed

civil penalty of $50,000.00. The decree placed the company in receivership and prohibited ECC from ever utilizing the Northside Sanitary Landfill for disposal of waste it has generated. According to the decree, ECC was given until 11/01/82 to return to complete compliance with environmental laws and regulations.

Date: 07/02/81
Document No.: 0122
Key Word: Community Relations
Description: The Indianapolis Star prints "Recycling Firm Will Pay $50,000 Fine."

Date: 07/16/81
Document No.: 0127
Key Word: Site Data
Description: T. Fitch and P. Allen (SWMS) conduct an inspection of the Four County Landfill near DeLong, Indiana and observe an ECC shipment arriving onsite. The manifest stated that the shipment contained "hazardous waste NOS (still and drum bottoms)" but sampling proved the drums to be filled with a liquid that had a concentrated solvent vapor. The shipment was refused and returned to ECC. ECC was reprimanded and warned to ship only approved wastes to Four County Landfill for disposal.

Date: 07/30/81
Document No.: 0129
Key Word: Site Data
Description: T. Fitch (SWMS) conducts an inspection of the ECC Barrel Storage facility and notes no improvements since the previous week's inspection.

Date: 08/07/81
Document No.: 0132
Key Word: Site Visits
Description: SWMS inspects the ECC Barrel Storage area and finds it to be extremely crowded with barrels of waste and in violation of RCRA regulations.

Date: 09/00/81
Document No.: 0135
Key Word: Legal Action
Description: ECC submits it's Voluntary Cleanup Plan (Phase I to commence on 9/15/81).

Date: 09/02/81
Document No.: 0133
Key Word: Community Relations
Description: Indiana Environmental Health News prints "The Enviro-Chem Recycling Corporation's operations in Boone County have had no negative effect on public health, although these operations have contributed to polluting nearby waterways . . ."

Date: 09/11/81
Document No.: 0139
Key Word: Legal Action
Description: D. M. Finton (ECC) requests special approval for the disposal of 500 cu yds of oil and paint contaminated soil at Northern Sanitary Landfill.

Date: 09/15/81
Document No.: 0143
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inspection of ECC's barrel storage facility. He noted work was being done to reduce barrel inventory, to drain the area of ponded surface water, and to clear an area for construction of a concrete drum storage pad.

Date: 09/25/81
Document No.: 0144
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inspection of ECC's barrel storage facility and notes an excessive number of barrels remaining onsite but preparation was continuing for the construction of the concrete drum storage pad.

Date: 09/29/81
Document No.: 0145
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inspection of ECC's barrel storage area and observes several setbacks in cleanup progress.

Date: 09/30/81
Document No.: 0170
Key Word: Generators/Waste Inventory

Description: Manifest documents dated 9/30/81 show Great Plains Bag Corporation to have shipped 15 drums of flammable solvents to ECC via Northway Environmental Service. At this time ECC was under court orders not to accept any hazardous waste.

Date: 10/02/81
Document No.: 0145
Key Word: Site Visits
Description: J. T. Fitch (SWMS) inspects the barrel storage area and estimates drum inventory to be in excess of 20,000 drums while ECC authorities claim there to be 16,300 barrels onsite. J. Wessel (ECC) presents Mr. Fitch with a production report that will be completed by ECC on a weekly basis.

Date: 10/06/81
Document No.: 0146
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inspection of the ECC site and takes 8 samples of contaminated soil.

Date: 10/14/81
Document No.: 0148
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an investigation of progress of cleanup activities as well as concrete pad construction at the barrel storage facility. Fitch made a second inspection on 10/16/81.

Date: 10/21/81
Document No.: 0150
Key Word: Site Visits
Description: J. T. Fitch (SWMS) inspects ECC's barrel storage facilities and production areas and notes several hazardous situations.

Date: 10/27/81
Document No.: 0154
Key Word: Site Visits
Description: J. T. Fitch (SWMS) randomly inspects the work product records of ECC clients to confirm that waste analyses had been received from the generators or adequate testing had been performed by ECC laboratory prior to acceptance by the

facility.

Date: 11/02/81
Document No.: 0150
Key Word: Sampling Testing
Description: R. C. Pickard (EMB) reports findings of ISBH Laboratories' analysis of contaminated soil samples obtained on 10/06/81 by J. T. Fitch (SWMS). It was found that when the soil was heated it exhibited the hazardous waste characteristic of ignitability. This qualifies the soil as hazardous waste as defined in 40 CFR 261.3 and must therefore be disposed of at an approved hazardous waste site.

Date: 11/04/81
Document No.: 0151
Key Word: Legal Action
Description: P. B. Rarick (OAG) presents a rough outline of most deadlines from the ECC consent Decree to G. Watson, Attorney at Law, receiver for ECC.

Date: 11/06/81
Document No.: 0155
Key Word: Site Visits
Description: J. T. Fitch (SWMS) visits ECC to review sampling and testing procedures of incoming loads with A. Spinner (ECC). Fitch also reviewed personnel records of those engaged in the handling of hazardous wastes including management personnel and found them to be inadequate under RCRA regulations. Operator inspections were also found to be inadequate.

Date: 11/24/81
Document No.: 0156
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inventory of the nonprocessed barrels of waste located at ECC and determines the total number of barrels to be 23,171.

Date: 12/01/81
Document No.: 0156
Key Word: Site Visits
Description: J. T. Fitch (SWMS) conducts an inventory of the number of leaking, former leaking, popped top, corroded/damaged,

and open top/bungless barrels onsite and on trailers offsite and determines the total number of barrels to be 223.

Date: 12/18/81
Document No.: 0158
Key Word: Legal Action
Description: ISBH makes recommendations to ECC in an effort to achieve compliance with all state and Federal Hazardous Waste Regulations. All recommendations were submitted with deadlines for completion as well as fines to be levied if the recommendations were not met.

Date: 12/31/81
Document No.: -159
Key Word: Legal Action
Description: R. C. Pickard (EMB) writes L. Pearson (OAG) to report several violations on the part of ECC of RCRA regulations as well as the agreed order signed July 1, 1981. Pickard explained that ECC was given until January 13, 1982, to bring the operation into full compliance. Pickard suggested that legal action should be taken and a fine levied if this deadline is not met. He also requested that action be taken to assure reduction of barrel inventory.

Date: 01/02/82
Document No.: 0160
Key Word: Site Data
Description: R. Strong (ECC) submits documentation concerning ECC's post accident restructuring program to the ISBH.

Date: 01/12/82
Document No.: 0161
Key Word: Site Data
Description: R. C. Pickard (EMB) writes G. Watson, receiver for ECC to state that contaminated sludge and soil previously considered to be ignitable hazardous waste had been determined to be hazardous waste by definition only and is suitable for disposal in an environmentally safe manner. Pickard requested ECC submit a plan for disposal immediately.

Date: 01/25/82

Document No.: 0167
Key Word: Site Visits
Description: J. T. Fitch (SMMS) inspects the site and instructs ECC not to ship or receive shipments of waste without both a manifest and a lab analysis for the waste. Violations of the Consent Decree were also discussed.

Date: 01/28/82
Document No.: 0164
Key Word: Sampling/Testing
Description: C. L. Bridges (ISBH) reports results of a bioaccumulation study conducted on live freshwater mussels in Finley Creek. Analysis showed lead, mercury, silver, PCB's, Aldrin, DDT, Heptachlor, Diazinon, Strobane, and Malathion were not found at detectable levels.

Date: 02/09/82
Document No.: 0166
Key Word: Legal Action
Description: EMB imposes a restriction on drum shipments to ECC of 200 drums per week until further notice. This freeze was imposed before the Boone County circuit Court to assure compliance with the Consent Decree regarding storage of drums, location and identification of material onsite and being shipped, and removal of sludge.

Date: 05/05/82
Document No.: 0005
Key Word: Legal Action
Description: Boone County Circuit Court Judge R. E. Drury orders ECC to close and environmentally secure its site for failure to reduce hazardous waste inventories. The order included requirements to cease receiving hazardous wastes and to submit a closure plan to the court.

Date: 05/07/82
Document No.: 0168
Key Word: Legal Action
Description: G. L. Watson, the Court's Receiver, files Phase I of the Closure Plan for ECC before J. Caldwell, Boone County Circuit Court, pursuant to the court's order of May 5, 1982.

Date: 06/04/82
Document No.: 0175
Key Word: Legal Action
Description: G. L. Watson, receiver for ECC files Closure Plan with the Boone County Circuit Court.

Date: 07/16/82
Document No.: 0175
Key Word: Legal Action
Description: R. C. Pickard (EMB) acknowledges receipt of the closure plan filed with the Boone County Circuit Court on June 4, 1982.

Date: 08/00/82
Document No.: 0222
Key Word: Legal Action
Description: ECC declares bankruptcy.

Date: 08/30/82
Document No.: 0181
Key Word: Sampling Testing
Description: G. H. Madany (EPA) reports analysis results of grab water samples obtained at the ECC pond on 8/9/82. Upon review of the results Madany concluded that no emergency action was justifiable.

Date: 08/30/82
Document No.: 0183
Key Word: FIT/TAT/REM Activities
Description: Wastex Research, Inc. submits four (4) separate proposals for "Environment revitalization, cleanup, and recycling of the ECC's waste site," to Attorney General Linley Pierson in Boone County Circuit Court.

Date: 09/00/82
Document No.: 0222
Key Word: Generators/Waste Inventory
Description: The generators entered into a loose coalition and hired Chemical Waste Management, Inc. to prepare a technical proposal for a complete surface cleanup. The generators then offered to pay for drum removal only in return for a complete release.

Date: 09/12/82
Document No.: 0184
Key Word: Community Relations

Description: Sun Times prints "Big Waste Dump Peril in Indiana."

Date: 09/13/82
Document No.: 0188
Key Word: Community Relations
Description: D. F. Johnstone, M.D., writes U.S. Senator R. G. Lugar requesting his assistance in seeking coverage under the Superfund Program for cleanup of the ECC site.

Date: 09/15/82
Document No.: 0185
Key Word: FIT/TAT/REM Activities
Description: McKesson Enviro-Systems, a major recycling company, confirms its position and interest in working with the State of Indiana, and Commercial Pumping to cleanup the ECC site by accepting a large volume of specified products and waste for recycling.

Date: 09/21/82
Document No.: 0189
Key Word: Generators/Waste Inventory
Description: The OAG holds a conference with the ISBH and representatives from approximately 60 generators to propose a voluntary cleanup plan for the ECC site. The closure plan and settlement offer required generators to remove and dispose of wastes and pay $250/drum into a trust fund to be used for remaining surface/subsurface remedial actions. In return, generators would receive a limited release. Generators were to state their intent to participate by 10/15/82.

Date: 09/24/82
Document No.: 0188
Key Word: Community Relations
Description: U.S. Senator R. G. Lugar writes A. Gorsuch, (U.S. EPA) to express concerns over the ECC situation and to request her consideration of the area for cleanup under the Superfund Program for addition to the National Contingency Plan Listing.

Date: 09/28/82
Document No.: 0186

Key Word: Community Relations
Description: D. West, private citizen, calls the APCD to complain about heavy offensive odors emanating from the vicinity of the Northside Sanitary Landfill and ECC on the evening of 9/27/82. R. Bowser and C. Wilson of the division investigate but determine no cause or source of the odors.

Date: 09/30/82
Document No.: 0192
Key Word: Legal Action
Description: The subcommittee on Environment, Energy and Natural Resources of the U.S. Congress requests all reports, analyses, memoranda, and other documents in EPA's possession relating to the ECC site in a letter to A. Gorsuch (U.S. EPA).

Date: 09/30/82
Document No.: 0193
Key Word: Community Relations
Description: The Indianapolis Star prints "Zionsville Waste Pond Object of 2 Federal Investigations."

Date: 10/00/82
Document No.: 0199
Key Word: FIT/TAT/REM Activities
Description: Remedial Response Section requests that the Center for Disease Control/Superfund Implementation Group (CDC/SIG) review sample data for the cooling pond and a residential well related to the ECC site. The conclusion of the CDC/SIG was that the low levels detected did not represent a risk deviating significantly from the norm.

Date: 10/01/82
Document No.: 0194
Key Word: Community Relations
Description: The Lebanon Reporter prints "Special Report Blames Plant, Not Landfill for Toxic Woes."

Date: 10/01/82
Document No.: 0195
Key Word: Community Relations
Description: The Indianapolis Star prints "EPA to Seek Draining of Hazardous Waste Pond."

Date: 10/02/82
Document No.: 0196
Key Word: Community Relations
Description: The Indianapolis Star prints "State Sets Deadline on Waste Site."

Date: 10/05/82
Document No.: 0197
Key Word: Community Relations
Description: The Indianapolis Water Company expresses concern over possible contamination of drinking water by ECC and/or Northside Sanitary Landfill to the ISBH.

Date: 10/05/82
Document No.: 0198
Key Word: Community Relations
Description: The Indianapolis Star prints "Geologist Defends Landfill Growth."

Date: 10/11/82
Document No.: 0205
Key Word: Community Relations
Description: D. Quayle (U. S. Senator) encourages A. Gorsuch (U.S. EPA) to evaluate the ECC site and consider listing the area on the Contingency Plan for cleanup under the Superfund program.

Date: 10/14/82
Document No.: 0204
Key Word: Community Relations
Description: Indiana Environmental Health News prints "State Health Commissioner Ronald G. Blankenbaker, M.D., Thursday called on anyone with information regarding potentially adverse health impacts of the Enviro-Chem/Northside Sanitary Landfill Sites in Boone County to supply that information to the Indiana State Board of Health immediately."

Date: 10/18/82
Document No.: 0211
Key Word: FIT/TAT/REM Activities
Description: G. Cekus (E&E) assists EPA personnel in sampling of the liquids in the cooling pond and drum storage sections of the ECC plant. A total of (6) locations were sampled. Twenty-nine samples were returned to the CRL for analysis.

Date: 10/19/82

Document No.: 0214
Key Word: Generators/Waste Inventory
Description: Approximately 80 representatives from generators meet in New York City for the purpose of submitting a response to the state's voluntary cleanup plan for ECC.

Date: 10/22/82
Document No.: 0212
Key Word: FIT/TAT/REM Activities
Description: ISBH issues cost estimates of the surface cleanup plan for ECC.

Date: 11/19/82
Document No.: 0226
Key Word: Legal Action
Description: A. M. Gorsuch (U.S. EP), informs U.S. Senator R. G. Lugar that she has submitted ECC for consideration to be eligible for Superfund monies.

Date: 11/22/82
Document No.: 0229
Key Word: FIT/TAT/REM Activities
Description: Chemical Waste Management, Inc., Environmental Remedial Action Division (ENRAC) submits: Technical Proposal for Removal and Disposal of Drummed Hazardous Chemicals and Waste Materials located at Environmental Conservation and Chemical Corporation, Zionsville, Indiana.

Date: 12/01/82
Document No.: 0223
Key Word: FIT/TAT/REM Activities
Description: T.R. West submits a proposal for disposal of cooling pond water, surface water and contaminated sludge for ECC site.

Date: 12/03/82
Document No.: 0225
Key Word: FIT/TAT/REM Activities
Description: J. A. Dikinis (U.S EPA) meets with P. Rarick (OAG) to discuss the proposed settlement for cleanup of the ECC site.

Date: 12/06/82
Document No.: 0226
Key Word: Legal Action
Description: R. M. Lavelle writes U.S. Senator Quayle to announce that the ECC facility is

Pentachlorophenol
2,4-Dimethylphenol

Phenol

Pesticides and PCB's (26)

Aldrin
Dieldrin
Chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
alpha-Endosulfan
beta-Endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide

alpha-BHC
beta-BHC
gamma-BHC
omega-BHC
PCB-1242
PCB-1254
PCB-1221
PCB-1232
PCB-1248
PCB-1260
PCB-1016
Toxaphene
2,3,7,8-Tetrachlorodibenzo p-dioxin (TCDD)

Metals (13)

Antimony (Sb)
Arsenic (As)
Beryllium (Be)
Cadmium (Cd)
Chromium (Cr)
Copper (Cu)
Lead (Pb)

Mercury (Hg)
Nickel (Ni)
Selenium (Se)
Silver (Ag)
Thallium (Tl)
Zinc (Zn)

Miscellaneous (2)

Asbestos (fibrous)

total Cyanides

RW15/11

being considered for inclusion in the National Priorities List.

Date: 01/03/83
Document No.: 0233
Key Word: FIT/TAT/REM Activities
Description: E&E issues REM-Field Investigation Team site safety plan.

Date: 01/20/83
Document No.: 0233
Key Word: FIT/TAT/REM Activities
Description: Initial site visit by CH2M HILL, EPA, and ISBH personnel for preparation of RAMP.

APPENDIX C

SAMPLING SUMMARY FOR PRIORITY POLLUTANTS

APPENDIX C
THE 129 PRIORITY POLLUTANTS

Volatile Organic Compounds (31)

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
1,1,1-Trichloroethane
1,1,2-Trichloroethane
1,1,2,2-Tetrachloroethane
Chloroethane
2-Chloroethyl vinyl ether
Chloroform
1,1-Dichloroethylene
1,2-trans-Dichloroethylene
1,2-Dichloropropane
1,3-Dichloropropene
Ethylbenzene
Methylene chloride
Methyl chloride
Methyl bromide
Bromoform
Dichlorobromomethane
Trichlorofluoromethane
Dichlorodifluoromethane
Chlorodibromomethane
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride
bis (Chloromethyl) ether

Base-Neutral Extractable Organic Compounds (46)

Acenaphthene
Benzidine
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachloroethane
bis (2-Chloroethyl) ether
2-Chloronaphthalene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluoranthene
4-Chlorophenyl phenyl ether
4-Bromophenyl phenyl ether
bis (2-Chloroisopropyl) ether
bis (2-Chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodi-n-propylamine
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a)anthracene
Benzo(a)pyrene
Benzo (b) fluoranthene
Benzo(k)fluoranthene
Chrysene
Acenaphthylene
Anthracene
Benzo(g,h,i)perylene
Fluorene
Phenanthrene
Dibenzo(a,h)anthracene
Ideno(1,2,3-cd)pyrene
Pyrene
bis(2-Ethylhexyl)phthalate

Acid Extractable Organic Compounds(11)

2,4,6-Trichlorophenol
d-Chloro-m-cresol
2-Chlorophenol
2-Nitrophenol
4-Nitrophenol
2,4-Dinitrophenol
4,6-Dinitro-o-cresol
2,4-Dichlorophenol